

MINERALOGICAL ABSTRACTS

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Notices of Books.

BOLDYREV (A. K.) & DOLIVO-DOBROVOLSKY (V. V.) [1904-1936]]
Болдырев (А. К.) и Доливо-Добровольский (В. В.). Определитель
кристаллов. BOLDYREV (A. K.) und DOLIVO-DOBROWOLSKY
(W. W.). *Bestimmungstabellen für Kristalle*. Vol. 1, part 1.
Введение. Тетрагирная сингония.—*Einleitung. Tetragyrische
Syngonie*. Leningrad & Moscow, 1937, 438 pp., 3 pls., 459 text-
figs., Price 15 r. (bound 16 r. 50 k.).

Preliminary accounts of this method for the determination of crystalline substances from goniometric measurements have already been given [M.A. 3-159, 6-462]. This first part of vol. 1 deals with tetragonal crystals, and a second part will include the trigonal and hexagonal. Four more volumes are promised for the orthorhombic, monoclinic, triclinic, and cubic systems. In addition to the two editors, 17 collaborators are named on the title-page. The introduction explaining the method (and criticizing others of the same aim [M.A. 2-100, 3-510, 137, 6-462]) is in Russian with a full German translation (pp. 69-118), and the indexes are in the two languages. The descriptive portion gives a summary of all the essential characters, so far as yet determined, of tetragonal substances. Crystal-forms are listed in order of their importance in three grades: those influencing the habit of the crystal, larger large faces, and then the smaller faces. In most cases all observed forms are included, but for minerals rich in faces the list is curtailed: for anatase 39 forms are listed. The polar angle ρ is given for each form. In two 'keys', one for non-minerals and the other for minerals (pp. 149-159), some 1700 polar angles are listed in numerical order from 0 to 90°. When one or two angles, measured on an unrecognized crystal, are compared with the 'keys' a selection of reference numbers is found in the descriptive portion.

L. J. S.

KLE (Arthur S.) [1862-1931]. *Mineral tables for the determination of minerals by their physical properties*. 3rd edition by Adolf PABST. New York (John Wiley & Sons) & London (Chapman & Hall), 1938, iii+73 pp. Price 7s. 6d.

This edition contains the same number of pages as the first edition of 1862. About 200 common minerals are tabulated according to the

colour of their streak in six groups, and these are subdivided according to the colour of the mineral, giving 17 sub-groups in each of which minerals are listed in the order of their degree of hardness. The first group 'streak, white or light grey' occupies two-thirds of the table and the last sub-group 'streak, white or light grey; colour, white, grey or colourless' contains 67 minerals—one-third of the number we started with; so the scheme does not seem to be a very practical one. There is of course much duplication; e.g. the main characters of quartz, calcite and fluorite are repeated in six of the sub-groups. L. J. S.

DAKE (H. C.), FLEENER (Frank L.), & WILSON (Ben Hur). *Quartz and other minerals. A handbook for the mineral collector.* New York & London (Whittlesey House: McGraw-Hill Co.), 1938, xvi+304 pp., 1 pl., 51 text-figs. Price 12s. 6d.

This is an interesting popular book designed to swell the present wave of enthusiasm for mineral collecting and amateur lapidary work, which is fostered by numerous local mineralogical societies and clubs in the United States. It gives good descriptions of the many varieties of common mineral quartz, and discusses in an interesting manner the possible modes of origin. Information is given of the localities where attractive specimens may be found, especially coloured agates, jasper and silicified wood in the western states. Chapters on silicification, opal and the cutting of gem quartz are included. There is unfortunately some confusion between quartz and silica; e.g. 'Tridymite is a rare form of quartz', and cristobalite (spelt christobalite on the next page) is 'another high-temperature quartz'. Quartz is silica, but all silica (SiO_2) is not quartz. There is also some confusion between the terms compact, massive, cryptocrystalline, and amorphous. It is scarcely correct to speak of 'amorphous quartz'. Minor errors and misprints are numerous. L. J. S.

New Minerals.

PALACHE (Charles), BAUER (L. H.), & BERMAN (Harry). *Yeatmanite, a new mineral, and sarkinite from Franklin, New Jersey.* Am. Min., 1938, vol. 23, pp. 527–530, 2 figs.

Fuller details are now given for yeatmanite [M.A. 7–14]; sp. 5.02 ± 0.1 ; the unit cell a 9.029, b 11.56, c 5.52 Å. contains $(\text{Mn}, \text{Zn})_{2} \text{Sb}_2 \text{Si}_4 \text{O}_{29}$; analyses I and II. Associated pink sarkinite gave α 1.792, β 1.794, γ 1.798; anal. III.

SiO ₂ .	Sb ₂ O ₅	As ₂ O ₅ .	ZnO.	FeO.	MnO.	MgO.	CaO.	Cl.	H ₂ O+.	Total.
13.50	18.01	—	34.54	0.36	33.00	—	—	—	0.54	99.95
14.16	18.48	—	28.35	0.90	37.06	—	n.d.	—	0.45	99.40
0.14	—	40.73	5.38	0.18	48.09	0.67	0.20	0.05	3.22	98.66

L. J. S.

TZER (George). *Veatchite, a new calcium borate from Lang, California.* Amer. Min., 1938, vol. 23, pp. 409-411.

This occurs in cross-fibre veins in limestone and howlite. It is monoclinic with cleavages (010) perfect and (001) poor. Sp. gr. 2.69, H. 2, $b, \gamma : c = -38^\circ$, $a 1.551, \beta 1.553, \gamma 1.621, 2V 37^\circ$, positive. Analysis F. A. Gonyer gave B₂O₃ 59.03, CaO 31.08, H₂O 9.50, insol. 0.62 = 23. X-ray photographs give a unit cell $a 6.72, b 41.26, c 41.20 : c = 0.163 : 1 : 0.998$ containing 48(Ca₂B₆O₁₁.2H₂O). The new mineral is compared with colemanite (Ca₂B₆O₁₁.5H₂O), meyerhofferite (B₆O₁₁.6H₂O), and inyoite (Ca₂B₆O₁₁.13H₂O).

L. J. S.

FERMOR (Sir Lewis Leigh). *Notes on vredenburgite (with devadite) and on sitaparite.* Proc. Nat. Inst. Sci. India, 1938, vol. 4, pp. 253-286.

Vredenburgite (L. L. Fermor, 1908) has been shown to be a lamellar intergrowth of hausmannite and jacobsite with some pyrolusite and omelane [M.A. 4-434, 5-206, 7-157]. Previous chemical analyses are calculated and discussed in detail, and the formula of the 'primary vredenburgite' from Beldongri (Nagpur) and Garividi (Vizagapatam) is given as 3Mn₃O₄.2Fe₂O₃; the 'secondary vredenburgite', resulting from a breakdown under altered metamorphic conditions, is expressed as R₃O₄+MnO₂. Material, also showing the 'vredenburgite structure', from Devada and Kodur in the Vizagapatam district, Madras [M.A. 1938] contains more iron and gives a formula 5Mn₃O₄.5Mn₂O₃.8Fe₂O₃. The primary mineral and 23R₃O₄+13MnO₂ for the secondary; the former is distinguished as *devadite*. The manganese-richer primary mineral of the 'vredenburgite group' from Beldongri and Garividi is provisionally named *garividite*. Recent work on sitaparite from India and from Postmasburg, South Africa, is also discussed.

L. J. S.

FERMOR (Sir Lewis Leigh). *On khoharite, a new garnet, and on the nomenclature of garnets.* Rec. Geol. Surv. India, 1938, vol. 73, pp. 145-156, 1 fig.

In 1912 the author suggested that enstatite chondrules rimmed with olivine in the Khohar meteorite had been derived from garnet on the base of pressure: 3(Mg,Fe)O.Fe₂O₃.3SiO₂ = 3(Mg,Fe)SiO₃+Fe₂O₃ and

$2\text{Fe}_2\text{O}_3 + 3\text{C} = 4\text{Fe} + 3\text{CO}_2$. A molecule $\text{Mg}_3\text{Fe}_2''(\text{SiO}_4)_3$ present (10.36%) in a garnet from the Jagersfontein diamond mine, analysed by P. Wagner in 1909, is now called khoharite. Some further compound names are devised for garnets of intermediate compositions [M 3-308].

L. J. S.

BELIANKIN (D. S.). *On the characteristic of the mineral "monothermit"* Compt. Rend. (Doklady) Acad. Sci. URSS, 1938, vol. 18, pp. 6 676, 1 fig.

A finely scaly clay from Chasov-Yar [Donetz, Ukraine] differs from kaolin in showing only one thermal effect in the heating curve, viz. endothermal effect at 550° and no exothermal effect at $900-950^\circ\text{C}$., in the higher birefringence, 0.02-0.03; $n 1.55-1.57$. Analysis of material after heating at 105°C . gave SiO_2 54.31, TiO_2 1.03, Al_2O_3 30.42, Fe_2O_3 1.18, MgO 0.48, CaO 0.57, Na_2O 0.44, K_2O 2.98, SO_3 0.20, ign. 8.37. At 105°C . 3.12% H_2O was lost. Formula, $0.2\text{RO} \cdot \text{Al}_2\text{O}_3 \cdot 3\text{SiO}_2 \cdot 1.5\text{H}_2\text{O} \cdot 0.5\text{H}_2\text{O}$. Part of the silica is present as quartz.

L. J. S.

[EFREMOV (N. E.)] Ефремов (Н. Е.). Беденит—новый минерал
Предварительное сообщение.—EFREMOV (N. E.). *Bedenite—a new mineral (preliminary information)*. Зап. Всеросс. Мин. О (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 479-485, 1 (Russian with English summary.)

Bedenite is white asbestos-like mineral found in association with cerolite in a plagioaplite vein cutting serpentinite at Beden on the river Bolshaya Laba, northern Caucasus. Analysis gave SiO_2 55.15, Al_2O_3 4.66, Fe_2O_3 7.18, FeO nil, MnO nil, MgO 19.09, CaO 13.00, Na_2O 1.00, K_2O nil, $\text{H}_2\text{O} + 1.60$, $\text{H}_2\text{O} - 0.10 = 100.78$; formula, $\text{H}_2\text{Ca}_2\text{Mg}_4\text{Al}_2\text{Si}_8\text{O}_{26}$. Its optical properties are: $\alpha' 1.634$, $\gamma' 1.638$, $\gamma - \alpha 0.006-0.008$. $2V$ large, negative, γ parallel to the fibre. Apparently this mineral belongs to the isomorphous series of orthorhombic amphiboles. Analyses of cerolite and plagioaplite are also given.

S. I. T.

MEIXNER (Heinz). *Sapperit (mineralische Zellulose) und Apophyllit dem Basalttuff von Perlstein, Oststeiermark*. Zentr. Min., Abt. 1938, pp. 208-211, 1 fig.

White fibrous material replacing wood enclosed in basalt-tuff of Miocene age from east Styria gave the reactions of pure cellulose (Sapperite of R. Potonié, Kohlenpetrographie, 1924), with no trace of lignin.

ociated are minute crystals of apophyllite, suggesting that hydro-
rmal action with HF produced the change in the wood.

L. J. S.

Meteorites.

RLIN (Axel). *How larger bodies may be built up out of small particles in interstellar space.* Zeits. Astrophysik, 1938, vol. 15, pp. 239-262, 5 figs.

A speculative discussion on the origin of meteorites. The resistance the atmosphere must be taken into account when calculating the velocity of escape in any case of material ejected by volcanoes on the nets; and the disruption of planets is improbable. Hyperbolic velocities indicate that meteorites come from outside the solar system. Charges resulting from cosmic ray bursts give rise to electrostatic attraction, and the limiting size of particles so formed is calculated to 4.7 cm. in diameter, which, it is noted, is about the size of the largest dendrites in meteorites.

L. J. S.

EKER (Ralph I., Jr.). *Observations pertaining to the times of meteorite falls.* (Abstract.) Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 330-331.

Falls (405) arranged chronologically, when plotted according to year, month, and hour, show no cyclical recurrence of any particular type of meteorite.

L. J. S.

EAD (Julia Lola). *Frequency and distribution of observed meteorite falls.* (Abstract.) Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, p. 331.

Of 536 witnessed falls 102 were in India, 79 in U.S.A., 53 France, Germany, and 23 Spain. Eleven were recorded in 1868 and none in 1832. There is no variation with longitude, but the northern hemisphere shows a large majority.

L. J. S.

ANS (Robley D.). *The determination of the age of iron and stony meteorites from their radioactivity.* Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 159-170, 3 figs.

A review of knowledge on the velocities of meteors (if of the solar system or from outside), age of meteorites, and isotopes in meteorites. A method of determining age from the AcU/UI ratio is suggested.

L. J. S.

BUDDHUE (John Davis). *Meteoritic iron phosphide*. Popular Astronomer, Northfield, Minnesota, 1938, vol. 46, pp. 282-285, 2 figs.

Frequency plots of schreibersite analyses show maxima corresponding to Fe_2NiP . Individual analyses range from $(Fe,Ni)_3P$ to $(Fe,Ni)_2P$, the latter no doubt due to solid solution [or inclusions] of metal in phosphide. A secondary maximum for $Ni + Co$ corresponds to a lack of Ni in many schreibersite analyses and an excess in those of rhabdites. Schreibersite lamellae have been recorded parallel to (100), (211) [M.A. 3-535, 5-300], and (110) of kamacite; the last have been called 'Brezina lamellae'. In a slice of the Canyon Diablo iron schreibersite lamellae parallel to (111) are seen in the centre of kamacite bands; these are called 'Shepard lamellae'. L. J.

[KRINOV (E. L.)] Кринов (Е. Л.). Спектральная отражательная способность образца № 308 метеорита „Саратов“ 1918 г.—Кринов (Е.). *The spectral reflecting power of the meteorite „Saratov“*. Астрономический Журнал (Astronomical Journal of Soviet Union), 1937, vol. 14, pp. 356-363, 2 pls., 4 text-figs. (Russian with English summary, p. 363.)

The reflecting power of a freshly broken surface of the Saratov meteoritic stone (fell 1918; specimen no. 308 in the Academy of Sciences) measured for different inclinations of the light and for wave-lengths 400-850 $\mu\mu$. The curve shows a low minimum between 750 and 800 $\mu\mu$ in the infra-red, with a rapid increase to 850 $\mu\mu$. L. J.

[KULIK (L. A.)] Куллик (Л. А.). К вопросу о самородном железе.—KULIK (L. A.). *Zur Frage über gediegenes Eisen*. Журнал Геофизики [Zhurnal Geofiziki], 1937, vol. 7, pp. 151-166, 9 figs. (Russian with German summary.)

It is suggested that the material of reported occurrences of terrestrial native iron is either meteoritic or artificial. The Ovifak iron [M. 6-191] is supposed to represent meteorites brought from the Greenland plateau by ice sheets and deposited in the terminal moraine. A general account is given of meteorites and meteorite craters, and a list of 86 U.S.S.R. meteorites up to November 1936. L. J.

ASTAPOWITSCH (I. S.). *A list of meteorites of the Soviet Union*. Journal of the Royal Astron. Soc. Canada, 1938, vol. 32, pp. 195-196.

A skeleton list is given of 90 meteorites from European and Asiatic Russia, stating the main type, date of fall or find of each, and

ection where now preserved. Many of the spellings of the names of meteorites are unfamiliar, and no indication is given of the precise localities.

L. J. S.

MAMOTO (Issei). *Preliminary list of meteorites in Japan*. Bull. Kwasan Observatory, Kyoto Univ., 1935, vol. 4, no. 306, 6 pp.

This list of 39 Japanese meteorites (including 3 doubtful, 2 from Korea, and 1 from China) is printed partly in English and partly in Japanese, giving locality, date of fall or find, main type, weights and sizes of specimens in various collections, and specific gravity. A detailed summary, with some slight modifications, and a map have been given by P. M. Millman [following abstract].

L. J. S.

MILLMAN] (P. M.). *Recent lists of meteorites: Meteorite statistics*. Journ. Roy. Astron. Soc. Canada, 1938, vol. 32, pp. 197-206, 4 figs.

Comments on the lists of Russian and Japanese meteorites [preceding abstracts] with maps showing their distribution. Other recent lists [A. 7-61-2] are also noted. Falls and finds of siderites, stony-irons, stones are tabulated and plotted in decades of years.

L. J. S.

Š (Zd.) & ROSICKÝ (V.), with chemical analysis by KOKTA (J.). *Meteorit ze Sazovic u Zlina.—Der Meteorit von Sazovice bei Zlín*. Časopis Moravského Zemského Muzea, Brno, 1937, vol. 30, pp. 1-9 (Czech), pp. 9-18 (German), 2 pls., 1 text-fig.

The fall of this stone at 8 p.m. on 28 June, 1934, at Sazovice near (49° 14½' N., 17° 34½' E.) in Moravia, was not seen, but a noise and dull thud were heard, and the stone was extracted from a depth of 1 m. in a turnip-field. A detailed petrographic description is given with chemical analysis (following abstract). Sp. gr. 3.571. In addition to constituents previously mentioned [M.A. 6-102] very little felspar is present.

L. J. S.

KOKTA (J.). *A study of Czechoslovak meteoric stones (chemical investigation)*. Coll. Czech. Chem. Comm., 1937, vol. 9, pp. 471-496, 12 figs. Five chondritic stones were decomposed by heating at 350-380° C. in a current of chlorine free from HCl, water, and oxygen [Min. Mag. 48], and the volatile chlorides and unattacked silicates analysed by thermo-chemical methods, for which some new modifications are described. Analysis of the silicates was made on about 15 mg. [which is sufficient for an average sample: weight of material decomposed

not stated]. I, Sazovice (preceding abstract). II, Lysá [= Lissa], Bohemia, fell 3 Sept. 1808. III, Kravín [= Tabor], Bohemia, 3 Sept. 1753. IV, Praskolesy [= Zebrak], Bohemia, 14 Oct. 1824. V, Kňahinya [= Knyahinya], Carpathian Ruthenia, 9 June 1866. Osann values these and of other analyses of chondrites, howardites, and eucrites plotted on diagrams and compared with terrestrial rocks. No relation between the amounts of iron in silicates and metal is to be noted.

	Silicates.	Metal.	Troilite.	Fe.	Ni.	Co.	P.	S.	Fe in
I.	83.95	9.13	6.92	76.20	7.11	1.12	0.02	15.75	1
II.	82.16	10.12	7.72	79.15	4.83	0.31	0.02	15.80	1
III.	75.76	17.00	7.24	83.38	5.12	0.46	trace	10.87	1
IV.	70.45	24.17	5.38	85.35	7.64	0.52	trace	6.65	1
V.	71.32	22.64	6.04	85.85	6.42	0.16	0.01	7.69	1

Also traces Cu, Cr, Mn, C; in V Cu 0.01.

	SiO ₂ .	TiO ₂ .	Al ₂ O ₃ .	Cr ₂ O ₃ .	Fe ₂ O ₃ .	FeO.	MnO.	MgO.	CaO.	Na ₂ O.	K ₂ O.	P ₂ O ₅ .	B
I.	45.94	0.07	3.68	—	0.34	17.52	0.83	27.78	2.83	—	1.03	0.06	
II.	43.12	0.02	2.25	0.07	1.25	17.62	1.12	29.41	3.02	1.66	0.46	0.22	
III.	43.89	0.09	2.91	0.10	0.82	14.12	0.71	32.10	3.82	1.25	0.09	0.18	
IV.	43.04	0.05	2.85	0.08	0.58	15.49	1.07	32.14	3.05	1.54	0.33	0.12	
V.	43.37	0.08	3.45	0.11	0.15	13.82	0.85	32.76	4.68	0.82	0.03	0.08	

L. J.

RÓŻYCKI (S. Z.) & KOBYLECKI (M.). *Les météorites de Lowicz. Informations recueillies sur le terrain de la chute et caractères généraux des spécimens.* [Zabytki Przyrody Nieożywienoje, 1936, pp. 181 (Polish with French résumé).] Abstract in *Neues Jahrb. für Mineralogie*, Ref. I, 1938, p. 211.

KOBYLECKI (Mieczysław). *Allgemeine Charakteristik des Meteorits Lowicz.—Charakterystyka ogólna meteorytu łowickiego.* Arch. Tow. Nauk. Warszaw. (Arch. Min. Soc. Sci. Varsovie), 1938, 14, pp. 1–8 (German), pp. 9–14 (Polish), 2 figs.

JASKÓLSKI (Stanisław). *Untersuchung undurchsichtiger Bestandteile des Meteorits von Lowicz im auffallenden Lichte.—Badania składników nieprzeczystych meteorytu łowickiego w świetle odbitym.* Ibid., pp. 15–36 (German), pp. 37–46 (Polish), 5 pls.

KOLACZOWSKA (Maria). *Mikroskopische Untersuchungen des Meteorits von Lowicz.—Badania mikroskopowe meteorytu łowickiego.* Ibid., pp. 47–51 (German), pp. 52–56 (Polish), 2 pls., 4 text-figs.

THUGUTT (St. J.). *Hauptbestandteile des Meteorits von Lowicz in chemischer Beziehung.—O składzie chemicznym ważniejszych składników meteorytu łowickiego.* Ibid., pp. 57–60 (German), pp. 61–64 (Polish).

MORITZ (H.). *Spektralanalytische Untersuchung des Meteorits von Lowicz.* Ibid., pp. 65–68.

OCKI (Jan). *Versuch einer Bestimmung des Radiumgehaltes im Meteorit von Łowicz.*—*Próba oznaczenia zawartości radu w meteorycie łowickim.* Ibid., pp. 69–73 (German), p. 74 (Polish abstract).

—(2) At 12.52 a.m. on March 12, 1935, a fireball was seen travelling east to west, detonation heard, and a shower of stones fell near Łowicz [52° 6' N., 19° 57' E.] in the Warszawa district. Stones were scattered along a track 9½ km. long over an area of 9 sq. km., and they were progressively larger towards the west. The largest stone (broken up by a finder) weighed about 10 kg. and the smallest 9.9 grams, the total weight of 58 stones recovered being about 59 kg. The meteorite is a siderite with a very irregular distribution of metal, the sp. gr. ranging from 4.14 to 7 (usually 4.6–5.9). Two stones found close together have sp. gr. 4.14 and 5.9. (3) The metal consists of grains of taenite showing Neumann lines, with little taenite bordering plessite, accessory schreibersite, chromite, troilite, and ilmenite, the last as rods enclosed in chromite. (4) The brecciated silicate grains are plagioclase (2V 80°, ext. on (010) 40°), orthorhombic and monoclinic pyroxenes. From the sp. gr. of two pieces the amount of metal is calculated as 71 and 53.5 wt. %. A polished surface of the meteorite shows a green phosphorescence in parts after exposure to X-rays. Analysis of the metal gave Fe 91.09, Ni 8.51, Co 0.50, insol. 0.53 = 100. Anorthite gave anal. I; olivine II (sp. gr. 3.4065); pale green spinel III. (6) Spectrum analysis showed the presence in both the metallic and silicate portions of 26 elements, usually in amounts less than 0.001 or 0.0001 %. (7) The radium content is less than 10^{-13} .

SiO_2 .	Al_2O_3 .	Fe_2O_3 .	FeO .	MnO .	MgO .	CaO .	Na_2O .	K_2O .	Total.	β .
46.14	33.32	—	—	0.36	18.78	1.12	0.28	100.00	1.579	
39.82	0.86	—	17.97	trace	41.98	—	—	—	100.63	>1.67
51.82	—	—	16.50	1.06	30.13	0.97	—	—	100.48	>1.689

L. J. S.

YOV (L. L.). *A chemico-microscopic study of a meteorite from Yurtuk village, Dnepropetovsk region, fallen on April 2, 1936.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1937, vol. 17, pp. 371–373.

At 1 a.m. on April 2, 1936, a brilliant blazing bolide was seen, with a crackling, clattering, whizzing noise, and a meteorite fell through the roof of a house in Yurtuk village, Lubimov village soviet, Mikhailov district [Ukraine]. A stone weighing 509 grams was found in the loft. Several fragments (one of 51.49 g.) were picked up near the house. The 51.49 g. piece shows some primary and secondary crust; it is pale

grey and tuffaceous; sp. gr. 3.299. It is wholly crystalline and ciated, with no chondrules and no metallic particles. Analyses of portions soluble (23.75 %) and insoluble in HCl give the bulk composition SiO_2 49.45, Al_2O_3 9.66, Cr_2O_3 0.04, Fe_2O_3 2.88, FeO 13.42, MnO 1.17, MgO 17.40, CaO 6.39, $(\text{Na},\text{K})_2\text{O}$ 0.31, S 0.181, P_2O_5 0.008 = 100 corresponding with clinobronzite 67.16, anorthite 27.61, olivine magnetite 2.05, troilite 0.56; while a micrometric analysis gave pyro 70.0, plagioclase (and maskelynite) 19.5, olivine 9.5 %. The stone achondrite, and is compared with amphotericite and eucrite. [In re lists of U.S.S.R. meteorites [M.A. 7-172] this meteorite is listed under the name Любимовка (Lyubimovka) or Lubimowka.] L. J.

KHAN (Mohd. A. R.). *On the meteoritic origin of the black stone of Ka'bah*. Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 403-407, 1 fig.

A review of the various historical accounts and speculations as to the nature and origin of the 'black stone' at Mecca. L. J.

ASTAPOWITSCH (I. S.). *On the fall of the great Siberian meteorite, June 1908*. Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 310-317, 1 fig.

A general review with many references to the literature. The meteorite travelled from SSW. to NNE. at 18-24° to the horizon and the length of its path was over 500 km. From the barographic and seismographic records of several stations the time is fixed at 0 h. 16m. G.M.T. The energy of the meteorite is estimated at about 10^{20} ergs, and its weight 200 tons. L. J.

MARBLE (John Putnam). *The Osseo, Canada, meteorite*. Amer. Journ. 1938, vol. 23, pp. 282-283, 2 figs.

Analysis of this mass of 46.3 kg. found in 1931 [M.A. 7-68] gives Fe 92.89, Ni 6.51, Co. 0.11, Cu 0.10, Pt, &c., 0.02, P 0.50, C 0.00, 100.137. L. J.

FOSHAG (William F.). *Petrology of the Pasamonte, New Mexico, meteorite*. Amer. Journ. Sci., 1938, ser. 5, vol. 35, pp. 374-382, 5 figs.

This meteorite, fallen March 24, 1933 [M.A. 6-105, 389, 398] is a brecciated eucrite (howardite), with a lustrous black crust (very unweathered). About 75 stones with a total weight of 3-4 kg. were collected along a track of 28 miles. Darker fragments of eucrite are embedded in a matrix of broken fragments of pigeonite and anorthite.

pigeonite grades from pale olive-green to dark brown, with α 1.698, γ 1.720 for light grains to α 1.723, β 1.728, γ 1.752 for dark s, 2V 0-25°; analysis of mixed light and dark portions in about amounts gave SiO_2 49.80, Al_2O_3 5.60, Fe_2O_3 nil, FeO (+ enclosed 28.16, MnO trace, MgO 10.96, CaO 7.03, Na_2O 0.26, K_2O 0.10 = 1. The anorthite has α 1.574, β 1.58, γ 1.586, indicating $\text{Ab}_{10}\text{An}_{90}$. Metallic iron is not visible except as minute inclusions in the pigeonite; amount was estimated by digesting the crushed meteorite with H_2O_2 . Tridymite, not recognized in the micro-sections, was separated from heavy liquid as colourless glassy grains, with α 1.468, β 1.470, γ 1.75, 2V about 40°, positive; SiO_2 95.5%. The bulk analysis of the olivine gave SiO_2 48.20, TiO_2 0.07, Al_2O_3 13.91, Cr_2O_3 0.30, Fe_2O_3 16.33, FeO 16.33, MnO 0.42, MgO 6.47, CaO 10.24, Na_2O 0.31, K_2O 2.76, P_2O_5 0.07, P_2O_5 nil = '100.21', corresponding with pigeonite anorthite 29.5, tridymite 3, iron metal 2.5, magnetite and chromite

L. J. S.

NGER (H. H.). *The Baxter meteorite*. Science, New York, 1938, vol. 87, p. 234.

The meteorite which penetrated a roof at Baxter, Missouri. Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 407-409, 2 figs.

Meteorite weighing 611 grams fell through the roof of a house near Baxter, Stone Co., Missouri, at 9 a.m. on January 18, 1916. Detonations were heard and men in a nearby field were 'showered with gravel'. It is of the ordinary chondritic type with metallic grains in a compact silicate matrix.

L. J. S.

NGER (H. H.). *Loss of nickel from meteorites through weathering*. Amer. Min., 1938, vol. 23, pp. 536-537.

Monitic material, representing completely oxidized fragments of the Nantan (Kansas) pallasite, contains 1.47 % Ni. Water extracts some nickel (together with Cl and SO_4) from such material. This leaching of nickel no doubt accounts for the failure to recognize meteorites in older literature. [M.A. 7-74.]

L. J. S.

TADE (José Ferreira de, Junior). *Estudo spectrochimico de um meteorito cahido em Cratéus, Estado do Ceará*. Ann. Acad. Brasileira Sci., 1931, vol. 3, pp. 57-63, 1 pl.

Spectrographic analysis of the Cratéus octahedrite [M.A. 5-15] showed Fe, Ni, Cr, Cu, Mg, Li, Ti, Ba, Ag. The portion (99.784 %)

soluble in dilute HCl contains Fe 92.00, Ni 7.41, Co trace, Cu 0.099.417, approximating to kamacite $Fe_{14}Ni$. Analysis of the insoluble portion (0.216 %) is interpreted as taenite 63.77, schreibersite 14.07, troilite 14.07, chromite 3.59, daubreelite 8.98 %. L. J.

BOON (John D.) & ALBRITTON (Claude C., Jr.). *Established and supposed examples of meteorite craters and structures*. Field & Laboratory Contr. Sci. Dept. Southern Methodist University, Dallas, Texas, 1938, vol. 6, pp 44-56.

A review of the literature with tabulation of explosion craters, including 'cryptovolcanic' structures (Cambrian to Jurassic in age) which may perhaps be of meteoritic origin. [M.A. 6-399, 7-72.] L. J.

BOON (John D.) & ALBRITTON (Claude C., Jr.). *The impact of meteorites*. Field & Laboratory, Contr. Sci. Dept. Southern Methodist University, Dallas, Texas, 1938, vol. 6, pp. 57-64.

A consideration of the effects of compression due to inertia when the velocity of the body is greater than that of the elastic waves in the medium. Pressures up to 25 million atmospheres and temperatures up to 100,000° C. are calculated. A large meteorite will be broken. [M.A. 6-399.] L. J.

WYLIE (C. C.). *A peculiar hole near Tiffin, Iowa. Second paper*. Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 221-224. [M.A. 7-74.]

Further suggested explanations are examined. The hole is most likely a swirl-pit formed during a river flood. L. J.

BUDDHUE (John Davis). *Chemical tests of "oxide" from the Tiffin*. Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 221-224.

The reddish-brown soil contains iron but no nickel. This, however, does not rule out meteoritic origin, since nickel is leached out from the rust. L. J.

Rock-forming Minerals and Petrology.

LARSEN (E. S.), IRVING (John), GONYER (F. A.), & LARSEN (E. S.). *Petrologic results of a study of the minerals from the Tertiary volcanic rocks of the San Juan region, Colorado*. Amer. Min., 1938, vol. 23, pp. 227-257, 417-429, 20 figs.

These two continuations [M.A. 7-31] deal with the felspars and

with a summary. Plagioclase phenocrysts show various types of zoning—normal, reverse, oscillatory; a theoretical explanation is offered. Chemical analyses are given of the zoned crystals. The anorthite content plotted against composition of the rock or of the groundmass gives only scattered points, suggesting that the phenocrysts are foreign (as plagioclase in the basalts and pyroxene in rhyolites). This may have happened by the sinking or floating of early formed crystals, by reaction of magma with the wall-rock, or by the mixing of magmas. Sanidine phenocrysts contain 25–57 % Ab with 3.7–0.1 % An. Partial analyses (Na₂O, K₂O in feldspar and in rock) and optical data are plotted. Significance to petrogenesis is discussed.

L. J. S.

СОЛОДОВНИКОВА (Л. Л.)] Соловникова (Л. Л.). Материалы к изучению полевых шпатов из пегматитовых жил Северной Карелии.—
SOLODOVNIKOWA (L.). *Beiträge zum Studium von Feldspäten aus Pegmatitgängen Nord-Kareliens*. Труды Ломоносов. Инст. Геохим. Крист. Мин., Акад. Наук СССР (Trav. Inst. Lomonossoff Géochim. Crist. Min., Acad. Sci. URSS), 1935, no. 5, pp. 3–86, 7 pl. (Russian with German summary.)

Analyses of microcline-perthite and plagioclase are given together with optical data and specific gravity. The average microcline-perthite corresponds to Mi 77.32, Ab 20.92, An 1.76, and the average plagioclase to 67.85, An 24.78, Mi 7.37. The genesis and classification of feldspars is discussed.

S. I. T.

ГЕРАСИМОВ (А. Р.)] Герасимов (А. П.). О полевых шпатах с горы Бештау (Северный Кавказ).—GUÉRASSIMOW (A.). *Sur les feldspaths de la montagne Bechtaou (Caucase du Nord)*. Академику В. И. Вернадскому к пятидесятилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 795–805. (Russian with French summary.)

No kind of feldspars are found in the trachyliparite of Beshtau: (1) soda-sanidine (anal. I), Or₆₅Ab₃₅, 2V 30–40°, negative, $\gamma - \alpha$ 0.005–0.006, $\beta - \alpha$ 0.003; (2) potash-oligoclase-albite or calcium-anorthoclase (anal. II), Or₁₃Ab₇₈An₉, 2V 46–66°, negative.

O ₂	Al ₂ O ₃	Fe ₂ O ₃	FeO	CaO	MgO	Na ₂ O	K ₂ O	H ₂ O	Total	Sp. gr.
27	19.43	0.15	0.32	trace	0.14	3.84	10.20	0.16	99.51	2.556
58	19.82	0.61	—	1.64	0.43	8.28	2.01	0.20	99.57	2.646

S. I. T.

[BELYANKIN (D. S.)] Белянкин (Д. С.). К определению понятию практике анортоклазов.—BELJANKIN (D. S.). *On the term practical definition of anorthoclases.* Изв. Акад. Наук СССР, Мат. Ест. Наук, Сер. Геол. (Bull. Acad. Sci. URSS, Cl. Math. Nat., Sér. Géol.), 1937, pp. 225–233. (Russian with English summary.)

The range of anorthoclase is extended so as to include soda-potash-felspars with small and large optical axial angles. Orthoclase is classed with anorthoclase.

S. I.

[VARDANYANTZ (L. A.)] Варданянц (Л. А.). Оптико-минералогическая характеристика анортоклазов неоинтрузий Большого Кавказа.—VARDANIANZ (L.). *Optical characteristics of anorthoclases of the Caucasian neointrusions.* Зап. Всеросс. Мин. Общ. (Mém. Russe Min.), 1937, ser. 2, vol. 66, pp. 441–456, 10 figs. (Russian with English summary.)

The values of $2V$ (negative) for anorthoclase from different Caucasian intrusive rocks varies from 20° to 90° . The dominant mode of frequency variation curves for $2V$ corresponds to the interval 46° and a minor mode to the interval 71 – 80° . The optical orientation of anorthoclase as measured to the cleavage planes (001) and (010), a (15.0.2), shows that it is definitely triclinic and isomorphous with orthoclase, although its optical orientation is very close to that of orthoclase.

S. I.

KUNO (Hisashi). *Hypersthene from Odawara-mati, Japan.* Proc. Acad. Tokyo, 1938, vol. 14, pp. 218–220.

Crystals (3 mm. long) of hypersthene in dacite-pumice from Hakone volcano, freed from inclusions of magnetite, glass, and augite, gave on analysis by S. Tanaka, SiO_2 53.24, TiO_2 0.23, Al_2O_3 1.05, Fe_2O_3 1.05, FeO 18.70, MnO 0.85, MgO 23.34, CaO 1.23, Na_2O 0.20, P_2O_5 traces, H_2O 0.10 = 100.12. This composition and the optical constants (α 1.691, β 1.701, γ 1.705, $2V$ 60°) are compared with previous data [M.A. 6–21; Min. Mag. 24–165, 221].

L. J.

HESS (H. H.) & PHILLIPS (A. H.) [1866–1937]. *Orthopyroxenes of the Bushveld type.* Amer. Min., 1938, vol. 23, pp. 450–456, 3 figs.

The orthorhombic pyroxenes of plutonic rocks often show a lamellar structure due to the intergrowth with a monoclinic pyroxene, which is suggested, separated by exsolution during slow cooling. Analyses of bronzite from Stillwater, Montana, show about $2\frac{1}{4}\%$ CaO .

L. J.

YUCHENKO (D. P.)] Сердюченко (Д. П.). Диопсид с хребта Креску в Карабае.—SERDUCHENKO (D. P.). *Diopside from the Khresku range in the Karachai*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 474–478, 1 fig. (Russian with English summary.)

White diopside from a veinlet in a serpentinized peridotite of the Karachai district, northern Caucasus, gave on analysis: SiO_2 54.61, Al_2O_3 1.87, Fe_2O_3 1.22, FeO nil, MnO nil, MgO 18.42, CaO 18.42, H_2O 0.61 = 99.87; with $2V$ 58°, positive, $\gamma:c=38-40^\circ$, $\alpha 1.669$, $\beta, r>v$.

S. I. T.

(C. E.), with chemical analyses by H. C. G. VINCENT. *Aluminous pyroxenes in metamorphosed limestones*. Geol. Mag. London, 1938, vol. 75, pp. 81–86, 1 fig.

Pyroxenes of fassaite and spinel occurring together in limestone: I, fassaite from Adhekanwela, Ceylon; sp. gr. 3.300, $\alpha 1.680$, $\beta 1.689$, $\gamma 1.706$, $\epsilon 1.73^\circ$ (also H_2O 0.08). II, fassaite from Monzoni, Tirol; sp. gr. 3.300, $\alpha 1.686$, $\beta 1.694$, $\gamma 1.712$, $\gamma:c=43^\circ$. III, spinel from Adhekanwela; sp. gr. 3.742, $n 1.744$. IV, spinel from Monzoni; sp. gr. 3.624, $n 1.738$ (deducting 0.85% CaO as pyroxene). In the presence of spinel olivite an alkali-poor aluminous pyroxene (fassaite) would be expected rather than diopside or hedenbergite. Analyses of such pyroxenes are plotted on a triangular diagram.

SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	$\text{H}_2\text{O}+$	Total
55.55	0.53	7.05	0.79	1.72	n.d.	15.57	24.08	0.12	0.92	100.41
3.09	0.49	7.61	3.09	0.42	0.03	15.11	25.34	nil	0.41	100.59
4.92	—	65.50	1.60	10.09	0.03	19.78	—	—	0.83	99.75
3.47	nil	66.37	1.45	5.55	0.08	24.89	—	—	0.70	100.51

L. J. S.

(Jun.). *On the occurrence of aegirine-augite in natrolite veins in a dolerite from Nemuro, Hokkaidō*. Journ. Fac. Sci. Hokkaidō Univ. Sapporo, Ser. 4, 1938, vol. 4, pp. 183–191, 1 pl., 3 text-figs. Augite veinlets of natrolite in analcime-olivine-dolerite augite have altered to aegirine-augite, plagioclase to natrolite, and olivine to clinochlore or chlorite, these changes having been effected by soda-rich vapours (Na_2CO_3 is suggested). The portion of porphyritic crystals of augite in the dolerite groundmass still consists of augite ($n_1 1.695$, $2V$ 50–57°, $\gamma:c=45-48^\circ$), while the portion projecting into the

natrolite vein consists of aegirine-augite (n_1 1.709, n_2 1.728, 2V 60°, $\gamma:c = 55-57^\circ$), the two portions being in parallel position with optic axial plane in the plane of symmetry. L. J.

WINCHELL (A. N.). *The anthophyllite and cummingtonite-grunerite*. Amer. Min., 1938, vol. 23, pp. 329-333, 2 figs.

Optical data published since the earlier paper [M.A. 5-32] are plotted against the composition $H_2Mg_7Si_8O_{24}-H_2Fe_7Si_8O_{24}$ for the orthorhombic and monoclinic amphiboles. 'Cummingtonite' from Western Australia analysed by E. S. Simpson [M.A. 5-147] was found to be a mixture of two amphiboles, that predominating (about 90 %) being orthorhombic with α 1.6265-1.6268 (calc.), β 1.6345, γ 1.6462, 2V $79\frac{1}{2}-81^\circ$, positive, and the other with α 1.6261 (calc.), β 1.6358, γ 1.6508, 2V 78° , positive, $\gamma:c = 18^\circ$. L. J.

IWAO (Shûichi). *On the optically positive colourless amphiboles in basic xenoliths*. Japanese Journ. Geol. Geogr., 1937, vol. 14, p. 115, 14 figs.

Optical data are given of cummingtonitic amphiboles present in basic xenoliths in dioritic rocks from several Japanese localities. These amphiboles are closely associated with hypersthene ($FeSiO_3$ 57%) from which they appear to have been derived, while they themselves pass over into common hornblende (for which optical data are given). L. J.

KUNO (Hisaki). *On the occurrence of a primary cummingtonitic hornblende in some dacites from Japan*. Proc. Imp. Acad. Tokyo, 1938, vol. 14, pp. 221-224, 2 figs.

Cummingtonitic hornblende does not appear to have been previously recorded in an undoubtedly igneous rock. Optical data are given for colourless crystals with a marginal zone of common green hornblende. When heated to $750^\circ C.$, this material changes into basaltic hornblende. L. J.

ERDMANNSDÖRFFER (O. H.). *Studien im Gneisgebirge des Schwarzwaldes*. VII. *Die „Kalksilikatfelse“ von Urach*. Sitz.-ber. Heidelberg Akad. Wiss. Math.-naturwiss. Kl., 1937, Abh. 5, 9 pp., 1 fig.

Green hornblende from a hornblende-plagioclase-rock banded garnet-rock and pyroxene-plagioclase-rock gave analysis by E. S. Simpson: SiO_2 43.82, TiO_2 0.22, rare-earths 0.02, Al_2O_3 15.79, Cr_2O_3 0.08, FeO

FeO 6.19, MnO 0.09, MgO 13.77, CaO 12.38, BaO 0.07, SrO 0.02, 2.08, K₂O 1.24, Li₂O 0.02, H₂O + 2.34, H₂O - 0.12, P₂O₅ 0.19, 11, F 0.06, NiO + CoO 0.02, CuO + PbO 0.02, ZnO trace, total 6; α' 1.635, γ' 1.668, 2V_v 72-74°, $c:\gamma$ = 15-17°. Other specimens 2V_a 70-72°, $c:\gamma$ = 18-22°, with zonal growths of optically positive negative portions in the same crystal.

L. J. S.

POLOVINKINA (Y. I.)] Половинкина (Ю. Ир.). О щелочных амфиболях из пород Кимканского железорудного месторождения в Мало-Хинганском районе ДВК.—POLOVINKINA (J.). *On the alcalic amphiboles from the rocks of Kimkan iron-ore field in the Malyi-Khingan region of the Far East.* Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 457-473, 11 figs. (Russian with English summary.)

tical properties and one chemical analysis of soda-iron-amphiboles ferruginous hornfelses are given. The analysed mineral belongs to group of abriachanite.

S. I. T.

SEN (Esper S.). *The accuracy of chemical analyses of amphiboles and other silicates.* Amer. Journ. Sci., 1938, ser. 5, vol. 35, pp. 94-103. Bivariate (2-4) chemical analyses made by different analysts on the powdered samples of six amphiboles from Colorado and Montana differences of up to 4.0% in the various constituents. These discrepancies disturb the author's confidence in paid analyses.

L. J. S.

SEITARÔ (Seitarô). *Petrological notes (19)-(32),* Japanese Journ. Geol. Geogr., 1938, vol. 15, pp. 125-129. [M.A. 7-30.]

Detailed analyses by S. Tanaka are given of twelve biotites from various types of Japanese rocks. Optical data are given in part; γ is from 1.638 to 1.675. Hornblende in hornblende-biotite-granofels from Hata, Yamaguti, gave SiO₂ 42.68, TiO₂ 1.88, Al₂O₃ 8.87, 2.37, FeO 22.46, MnO 1.30, MgO 5.48, CaO 10.95, Na₂O 1.00, 0.67, H₂O + 1.70, H₂O - 0.17, P₂O₅ trace = 99.53; α 1.673, β 1.692, 01, 2V 58° 30'-59° 30', $\gamma:c$ = 15°. The first record of staurolite in Japan is in phyllonite from Shiohira, Ibaraki; β 1.743, $\gamma - \alpha$ 0.011.

L. J. S.

WILLIAMS (W. I.). *The composition and occurrence of garnets.* Amer. Min., 1938, vol. 23, pp. 436-449, 8 figs.

Ca, Mn, sp. gr., and n were determined for 23 garnets from various

types of rocks, and 223 analyses from the literature are plotted on angular diagrams for eight rock types. The almandine and spessartine molecules predominate in pegmatites and granites, pyrope in peridotites, almandine in biotite-schists, grossular and andradite in calcareous contact rocks, &c.

L. J.

STOSE (George W.) & GLASS (Jewell J.). *Garnet crystals in cavities in metamorphosed Triassic conglomerate from York County, Pennsylvania.* Amer. Min., 1938, vol. 23, pp. 430-435, 3 figs.

Crystals of andradite occur with haematite in cavities left by solution of limestone pebbles. They show an isotropic centre ($n = 1.700$) with outer birefringent zones ($n 1.865$, birefr. 0.003). When heated to 860° C. the anisotropic material becomes isotropic.

L. J.

YOUNG (John A., Jr.). *Keilhauite, a guide mineral in the Sterling green gneiss of Rhode Island.* Amer. Min., 1938, vol. 23, pp. 149-152, 1 fig.

Keilhauite, separated from crushed rock, differs from normal sphene in having a rather larger optic axial angle and lower refractive index. For analysed material (by F. A. Gonyer), SiO_2 29.85, TiO_2 0.05, $\text{Yt}_2\text{O}_3 + \text{Ce}_2\text{O}_3$ 3.58, Al_2O_3 7.32, Fe_2O_3 6.17, CaO 22.37, H_2O 0.10, 100.26, sp. gr. 3.557, $2V$ $35-40^{\circ}$, α 1.843, β 1.870, γ 1.943. The pattern is identical, and in different samples there is a gradation to normal sphene, R_2O_3 apparently replacing both CaO and TiO_2 . In another granite mass in the same district there is no keilhauite.

L. J.

EDWARDS (A. B.). *The formation of iddingsite.* Amer. Min., 1938, vol. 23, pp. 277-281, 3 figs.

Iddingsite in basalts from Lady Julia Percy island and from the district, Victoria, is a deuteritic mineral formed by the action of vapour on olivine during or after extrusion of the magma. If, owing to complete separation of iron oxides had already separated, iddingsite was not formed. Tachylite margins contain fresh olivine; and in the interior of the tachylite the iddingsite is sometimes surrounded by a later growth of fresh olivine.

L. J.

BELJANKIN (D. S.) & PETROV (V. P.). *Occurrence of cristobalite in metamorphic rock.* Amer. Min., 1938, vol. 23, pp. 153-155, 2 figs.

Cristobalization of quartz grains in an Upper Tertiary argillite-sandstone beneath basalt near Nomanevi in western Georgia [

asia] has already been briefly described [M.A. 7. 24]. Of the various questions as to its origin the contact action of the basalt seems to be most probable.

L. J. S.

WOLDS (Doris L.). *Transfusion phenomena in lamprophyre dykes and their bearing on petrogenesis.* With micro-chemical analyses by Edith KROUPA. Geol. Mag. London, 1938, vol. 75, pp. 51-76, 7 figs. Lamprophyre dykes at Ards, Co. Down, and Newmains, Dumfries-shire, show xenoliths of vein quartz with pink felspathic rims, and veins of the same material extending into the lamprophyre. There has been an introduction of Al, Na, K, Ca. Such a process may account for the series lamprophyre-porphyrite porphyry. [Min. Mag. 24-367.]

L. J. S.

WATKIN (Edgar D.). *Anatetic veins at Gonubie river mouth.* South African Journ. Sci., 1937, vol. 33, pp. 248-253, 2 pls., 1 text-fig. A dolerite sill shows at its margins metamorphosed sandstone with a graphic intergrowth of quartz and felspar. Similar material is found in veins and in small pale inclusions in the dolerite. [M.A. 7-44.]

L. J. S.

WATANABE (Hisashi). *Fractional crystallization of basaltic magmas.* Japanese Journ. Geol. Geogr., 1937, vol. 14, pp. 189-208, 12 figs.

Weight percentages of normative felspars (Or, Ab, An) and pyroxenes (Wo, En, Fs) are calculated from published analyses of basalts from various parts of the world, and plotted on pairs of triangular diagrams. Felspars richer in An and Or tend to be associated with pyroxenes rich in En or En and Wo, while those rich in Ab come with pyroxenes rich in Fs or Fs and Wo. It is suggested that these rocks are differentiated by fractional crystallization from some more basic magma, e.g. olivine-eucrite; and that by still further differentiation rhyolites result.

L. J. S.

WEBB (Harry H.). *A primary peridotite magma.* Amer. Journ. Sci., 1938, ser. 5, vol. 35, pp. 321-344, 6 figs.

The argument that in certain cases ultrabasic rocks represent the intrusion of an ultramafic magma, rather than differentiation products, is based on the presence of much water which would lower the melting-point and eventually rise to the formation of serpentine. Examples of both types are described from the Stillwater complex in Montana.

L. J. S.

BACKLUND (Helge G.). *The problems of the rapakivi granites.* J. Geol. Chicago, 1938, vol. 46, pp. 339-396, 2 figs.

— *The rapakivi puzzle. (A reply.)* Geol. För. Förh. Stockholm, vol. 60, pp. 105-112.

— *Zur "Granitisationstheorie".* Ibid., vol. 60, pp. 177-200.

An argument that the rapakivi granites of Fennoscandia have resulted by the metasomatism of Jotnian sandstone due to emanations of aluminates.

L. J.

QUIRKE (T. T.). *New nepheline syenites from Bigwood township, Ontario.* Trans. Illinois Acad. Sci., 1936, vol. 29, pp. 170-185.

Intrusive rocks at Bigwood in the Sudbury district grade from adularite to litchfieldite. Bigwoodite is composed of microcline, albite, microperthite, and little hornblende, the potash-felspar predominating over soda-felspar. Rutterite consists of the same felspars (plagioclase predominating) with little nepheline and more hornblende.

L. J.

ERNST (Theodor). *Der Melilith-Basalt des Westberges bei Hofgeismar nördlich von Kassel, ein Assimilationsprodukt ultrabasischer Gesteine.* Chemie der Erde, 1936, vol. 10, pp. 631-666, 16 figs.

Nodules of olivine and pyroxene present in this rock are shown to be relics of fragments of ultrabasic rocks brought up with the magma from depth: they are not segregation products as previously thought. An analysis is given of the rock, and the composition of the original magma is calculated. The composition appears to have been slightly affected by the assimilation of sedimentary rocks. Optical constants are given of the olivine, bronzite (α 1.673-1.675, β 1.677-1.682, γ 1.686, sp. gr. 3.31-3.34), and diopside (α 1.683-1.691, β 1.688-1.705, γ 1.705-1.714, 2V 54.1-55.7°, $\gamma:c$ = 38.3-41.8°). Analysis of the olivine side gave SiO_2 52.43, TiO_2 0.37, V_2O_5 0.01, Al_2O_3 4.16, Cr_2O_3 0.01, Fe_2O_3 2.66, FeO 3.53, NiO 0.08, MnO 0.12, MgO 18.19, CaO 1.03, BaO 0.03, Na_2O 0.96, K_2O 0.07, $\text{H}_2\text{O}+$ 0.09, $\text{H}_2\text{O}-$ 0.11 = 100. sp. gr. 3.33, α 1.6814, β 1.6861, γ 1.7047, 2V 55° 10', $\gamma:c$ = 38° 59'.

L. J.

BRIDGES (R. J.). *On a suite of igneous rocks near Kidete, Tanganyika, and associated development of copper ore.* Trans. Geol. Soc. S. Africa, 1936, vol. 38 (for 1935), pp. 1-28, 3 pls., 4 text-figs.

Describes a belt of country of about 1000 sq. miles in Tanganyika.

ory. The Archaean gneisses are cut by a series of younger igneous rocks ranging in composition from soda-granite to gabbro and hornblende-peridotite. Full descriptions are given, with modes and chemical analyses. The copper ores, chalcosine, bornite, and chalcopyrite, are found in small quantities in both basic and acid pegmatites and in kyanite-scapolite veins; they have no economic significance.

S. J. S.

THOMAS (Arthur). *A record of new analyses of Tertiary igneous rocks from Antrim and Staffa*. Proc. Roy. Irish Acad., 1936, vol. 43, sect. B, no. 8, pp. 89-94.

Detailed chemical analyses are given of olivine-basalt, basalt, olivine-ite, and rhyolite.

L. J. S.

LEIEFF (S. I.). *Petrochemistry of the Scottish Carboniferous-Permian igneous rocks*. Bull. Volcanologique, Napoli, 1937, ser. 2, vol. 1, pp. 59-87, 12 figs.

This is a regional petrographic study of Carboniferous-Permian igneous rocks of the Midland Valley of Scotland. Statistical study of 200 analyses, combined with the evaluation of the relative amounts of a types, leads to the genetic classification of rocks into three principal and two collateral series. The origin of the series and of the types discussed.

S. I. T.

THOMAS (Arthur). *A contribution to the petrology of kimberlite and its inclusions*. With chemical analyses by L. S. THEOBALD. Trans. Geol. Soc. South Africa, 1937, vol. 39 (for 1936), pp. 379-427, 1 pl., 2 text-figs.

Descriptions and detailed analyses are given of materials on which determinations of He, U, and Th had previously been made [M.A. 6-522]. These include kimberlite, olivine-melilitite, saxonite, harzburgite, lherzite, phlogopite-rock, eclogite, basic granulite, biotite-appinite, and chrome-diopside. The 'hardebank' kimberlite from a dike in Dutoitspan shows fractured and corroded fragments of olivine and frayed fibres of phlogopite in a confused groundmass with perovskite, calcite, spinel, prehnite, &c. A large crystal of chrome-diopside ($\beta > 1.66$, $\gamma = 50^\circ$, $2V 70-75^\circ$, positive) from Jagersfontein shows a lamellar growth on (001) of thin layers of a colourless to pale green pyroxene ($\beta = 1.66$, $\gamma:c = 24^\circ$, $2V 54^\circ$, positive), which is perhaps clinoenstatite. Analysis of the two together gave SiO_2 54.09, TiO_2 0.28, ZrO_2 0.12,

Al_2O_3 1.57, Cr_2O_3 2.03, V_2O_3 0.07, Fe_2O_3 0.74, FeO 1.47, NiO 0.09, MnO 0.09, MgO 16.96, CaO 21.10, SrO 0.01, Na_2O 1.37, K_2O 0.01, CO_2 0.26, Cl, S traces, $\text{H}_2\text{O}+$ 0.22, $\text{H}_2\text{O}-$ 0.08 = 100.64. The soda is perhaps present as chrome-acmite, $\text{NaCrSi}_2\text{O}_6$. L. J.

BANDY (Mark C.). *Geology and petrology of Easter Island*. Bull. Geol. Soc. Amer., 1937, vol. 48, pp. 1589-1610, 4 pls., 1 text-fig. M.A. 6-298.]

Descriptions with chemical analyses are given of basalt, andesite, obsidian, &c. The glass (SiO_2 72.32%, sp. gr. 2.333, n 1.496) of the obsidian differs only slightly in composition from the enclosed spinelites. L. J.

TAYLOR (J. H.). *A contribution to the study of accessory minerals in igneous rocks*. Amer. Min., 1937, vol. 22, pp. 686-700, 3 figs.

Counts of grains of different minerals isolated from the crushed rocks show that the range of variation in the four intrusions of the Mt. Mts. granite is of the same order as in any one intrusion. Zircon and fluorite show differences according to the distance from the roof of the intrusion. L. J.

REED (John C.). *The study of accessory minerals in igneous and metamorphic rocks*. Amer. Min., 1937, vol. 22, pp. 73-84.

A committee on this subject, appointed by the National Research Council, has considered the definition of an accessory mineral and prepared abstracts of papers. A review of these papers (largely British) is given. L. J.

LACROIX (Alfred). *Les roches grenues conjointes de l'ankarartrite du Tarkarindoha, à Madagascar*. Compt. Rend. Acad. Sci. Paris, 1938, vol. 206, pp. 548-552.

Re-examination of the pegmatitoid of Mt. Takarindoha, which consists predominantly of etinditic ankarartrite, shows that a basaltic pyroxenolite also occurs, which is distinguished by excess of SiO_2 , of K_2O compared with Na_2O . It is the melanocratic form of a subpotassic fasinite, and consists predominantly of titaniferous augite with large crystals of olivine between which is nepheline and what appears to be much-altered leucite, and also some biotite and titanomagnetite. The pegmatitoid is holocrystalline and mesocratic, and is composed of augite as small laths, with considerable nepheline and apatite, and some

les of phillipsite which appear to have resulted from autopneumatot-
a dating from the end of the cooling of the rock. Complete analyses
of three rocks are given.

C. A. S.

ROIX (Alfred). *Sur un nouveau type basaltique, forme d'épanchement
d'une norite et comparable, au point de vue chimicominalogique, aux
météorites feldspathiques.* Compt. Rend. Acad. Sci. Paris, 1937, vol.
204, pp. 1909-1913.

Sakalavite is a new type of lava from Mt. Togobory, Sakalava,
Madagascar. It is black, rich in free silica (7.56%), and represents the
dioritic or basaltic group of dacites. It is a bytownitic α -basalt. The
microscope shows phenocrysts of bronzite, in places passing into pigeon-
ite and plagioclase (bytownite with some andesine). It resembles the
dioritic howardites and eucrites.

C. A. S.

SAIR (P.). *Sur l'origine du granite du Pelvoux.* Compt. Rend. Acad.
Sci. Paris, 1938, vol. 206, pp. 189-190.

A more careful examination has shown that, contrary to the view that
there are here few signs of contact action between the granite and en-
closing schists, starting from the unaltered schist there is first a zone
where this has been invaded by veins of aplite, then one of granite
bearing blocks of amphibolite-gneiss, which is succeeded by a granite
characterized by the presence of many coloured elements, which thin
sections show to be a monzonitic granite containing numerous zircons
surrounded by well-developed pleochroic haloes. This in turn gradually
passes into the usual leucocratic granite with its small proportion of
($< 1\%$) and ferromagnesian minerals (MgO 0.5, Fe_2O_3 1.5%).

C. A. S.

SEMINE (Mme Élisabeth). *Sur les lherzolites en voie de serpentinitisation
des Vosges lorraines.* Compt. Rend. Acad. Sci. Paris, 1938, vol. 206,
pp. 441-443.

In one of the six occurrences examined, the rock, where exposed to
weather, is completely serpentinitized to a reticulated antigorite. This
is less and less the case as the interior of the mass is approached. The
minerals are olivine, enstatite, and a monoclinic pyroxene, some-
times uralitized. Other occurrences show a similar composition, but
with different relative proportions of the constituents. All are lherzolites
or harzburgites. In some garnet occurs, more or less transformed to
a lymphitic aggregate of fibrous pyroxene with occasionally spinel,

enstatite, and amphibole, bordered by granoblastic hypersthene. In places this is all replaced by chlorite and talc. Complete analyses of the herzolites are given.

C. A.

LEGOUX (Pierre). *Sur la série magnésienne et les roches supracrustales de l'ouest de la Côte d'Ivoire.* Compt. Rend. Acad. Sci. Paris, 1938, vol. 205, pp. 158-160.

The series is predominantly leucocratic. It is characterized by magnesian hypersthene, which is often associated with pigeonite and feldspar containing fusiform micropertite with some orthoclase in the oligoclase and some microcline. The most usual types are quartziferous norites and hypersthene-granites. The whole appears to be the result of migmatization and anatexy, a conclusion strengthened by the presence of fragments of quartzite, pyroxenites, and amphibolites which form true veins cutting across the various types of granite, which are supracrustal formations. Finally, the eruptive rocks appear to be, partially at least, the result of digestion of more ancient rocks, the highly metamorphosed remains of which form these fragments.

C. A.

LONGCHAMBON (Henri). *Sur les gneiss et granites à cordierite dans le massif central français.* Compt. Rend. Acad. Sci. Paris, 1938, vol. 206, pp. 846-849.

It is sought to trace a gradual passage from a core of anatexic granite through various cordierite-gneisses to an aureole of sillimanite-gneiss, the changes being specially associated with the varying stability of biotite. The ultimate chemical composition of the rocks gives some guidance as to the nature of these changes, and accordingly it is suggested that, apart from changes in pressure and temperature and in composition so far as concerns the constituents now present, the changes must have been largely influenced by the presence of volatile mineralizing agents such as compounds of F, B, and Cl, of which, especially chlorine, there are distinct traces in the cordierite zone.

C. A.

SZTRÓKAY (Kálmán). *A Descabezado (Chile) vulkáncsoporthoz kötőrészéből származó vulkáni hamu közöttani vizsgálata.*—SzTRÓKAY (K.). *Petrographische Studien an der Asche des Vulkans Quizaro (Chile).* Földtani Közlöny, Budapest, 1936, vol. 66, pp. 122-132, 1 fig. (Hungarian with German summary.)

Dust collected at Buenos Aires, 1200 km. from the Quizaro volcano, after the eruption of April 1932, had dimensions 0.05-0.02 mm. and consisted mainly of glass together with plagioclase, apatite, and h

de. Analysis corresponds with a yosemite magma; but since heavy minerals had been lost during air transportation, the original magma may have been more basic. [M.A. 5-374; 6-300.] V. Z.

IN (Homer D.). *Some metamorphic terminology*. Amer. Min., 1938, vol. 23, pp. 119-120.

ew terms suggested are: phenoclast and phenoblasts for mineral ases corresponding to phenocrysts; schistoclastic, granoclastic, and isoclastic for rock structures. L. J. S.

RSON (Earl). *Fabric analysis of a coarsely crystalline polymetamorphic tectonite*. Amer. Journ. Sci., 1936, ser. 5, vol. 31, pp. 161-187, 30 figs.

detailed description in English of Sander's methods [M.A. 4-340] ed to a muscovite-biotite-schist from Niederthal, Tyrol. The chnic history of the schist is derived from the optical orientation hams of the constituents, quartz and mica. F. A. B.

REY (C. E.). *Cummingtonite-bearing rocks from the Lewisian*. Geol. Mag. London, 1938, vol. 75, pp. 76-81.

the cummingtonite-garnet-schists rich in manganese of Loch Bad an pig, Gairloch, Ross-shire, contain also quartz or carbonates (40 % apolite and ankerite), and are accompanied by banded quartz-feldsparite-magnetite-schists of eulysitic facies [Min. Mag. 24-331].

L. J. S.

OZSNIK (Pál). *Új adatok a Nagybihar (Cucurbeta) metamorf közeteiről ismeretéhez.—Neue Beiträge zur Kenntnis der metamorphen Gesteine der Umgebung des Nagybihar (Cucurbeta)*. Földtani Közlöny, Budapest, 1935, vol. 65, pp. 81-90, 1 plate (table of analyses), 2 text-figs. (German with Hungarian summary.)

On the basis of chemical analyses it is shown that the amphibolites albitic gneisses of the Nagybihar (Cucurbeta) Mt. in the Bihar Mts. been formed from eruptive rocks. Further, it is suggested that porphyroidal rocks of the nappe of the southern Bihar Mts. are in mylonites derived from the associated augen-gneisses. V. Z.

ROSE (J. W.). *Progressive kinetic metamorphism in the Missi Series near Flinflon, Manitoba*. Amer. Journ. Sci., 1936, ser. 5, vol. 32, pp. 257-286, 6 figs.

—Cambrian greywackes and conglomerates show three zones of

progressive metamorphism characterized respectively by chlorite, tite, and garnet. Intruded igneous rocks in the series are also affected in a like degree. These zones are related to the intensity of shearing in the rocks, and it is suggested that the heat developed by the shearing was sufficient to cause the metamorphism. L. J.

HENTSCHEL (H.). *Der Eklogit von Gilsberg im sächs. Granulitgebirge seine metamorphen Umwandlungsstufen.* Min. Petr. Mitt. (Tsch. mak), 1937, vol. 49, pp. 42-88, 15 figs.

A small exposure in an old quarry shows bands of eclogite surrounded by a biotite-pyroxene-rock in serpentine. Large crystals of pyroxene, set in a groundmass of pyroxene and garnet, show a fine lamellar intergrowth with garnet which is usually altered to kelyphite. The lamellae are much contorted and there is a definite crystallographic relationship between the two minerals, the garnet being flattened on (110) and (001) parallel to [001] of the pyroxene. These large crystals are typical of a pyroxenite, and the breaking down of an aluminous pyroxene has given rise to garnet. Later alterations are to hornblende, enstatite, spinel, and plagioclase, and the rock grades through an amphibolite facies to a hornfels facies. L. J.

LONGCHAMBON (Henri). *Sur la genèse des gneiss et granulites à sillimanite dans le massif central français.* Compt. Rend. Acad. Sci. P. 1937, vol. 205, pp. 567-569.

It is suggested that the formation of the various sillimanite-gneisses and granulites and cordierite-gneisses and granites of this region can be explained by there having been originally Fe- and Ti-rich biotite-schists, which, save for any tourmaline they might contain, became unstable in contact with a fluorine-containing granulite magma and formed injection gneisses. In these the Fe and Ti oxides appear partly as tourmaline, but largely as the free oxides, distributed mostly as in the felspars, giving rise to their prevailing reddish tint; the M₂Si₃O₁₀ silicates (tremolite, talc, &c.); the SiO₂ and Al₂O₃ and any pre-existing Al silicates formed feldspar, or if CaO were deficient, sillimanite, while much of the biotite gave rise to muscovite. C. A.

ROYER (Louis). *La thermoluminescence de certaines roches cristallines phylliennes et éruptives d'Algérie.* Compt. Rend. Acad. Sci. P. 1937, vol. 204, pp. 602-604.

A series of crystalline rocks, phyllites, mica-schists, amphibolites

sses, and marbles, along the coast of Algeria between Cherchel and ~~a~~ exhibit strong thermoluminescence, which is greenish, except in marbles in which it is orange-yellow. It is always associated with presence of orthoclase, and is not affected by treating the rock with ~~ic~~ acid, and therefore is not due to organic matter. Its intensity decreases with the age of the rock. Volcanic rocks in the neighbourhood, ~~olites~~, dacites, and andesites, show little or none. C. A. S.

ER (Louis). *Nouvelles observations sur la thermoluminescence de certaines roches cristallophyliennes*. Compt. Rend. Acad. Sci. Paris, 1937, vol. 204, pp. 991-993.

Although as a rule thermoluminescence is confined to the more ancient ~~talline~~ schists, and is exhibited by such schists in many other places ~~in~~ Algeria, no definite relation between age and it is traceable. In case of marbles it seems to be more marked the more impure the ~~sample~~ is. C. A. S.

TT (Walter F.) & FAUST (George T.). *Pencatite from the Organ Mountains, New Mexico*. Amer. Min., 1937, vol. 22, pp. 1151-1160, 15 figs.

artz-monzonite intruded into dolomite at this locality [M.A. 6-297] given rise to a rock composed of calcite 61.9 and brucite 25.7 %, latter with small amounts of magnesite, periclase (as residual cores to brucite), and forsterite (mostly altered to serpentine). L. J. S.

SPEED (G. E.). *Development of quartz porphyroblasts in a siliceous Hornfels*. Amer. Min., 1937, vol. 22, pp. 133-138, 4 figs.

otted hornfels from Wallowa Mts., Oregon, shows stages in the development of small (0.5 mm.) clusters of quartz crystals which sometimes show crystal-faces. L. J. S.

SPEED (G. E.). *Development of plagioclase porphyroblasts*. Amer. Min., 1937, vol. 22, pp. 1133-1138, 7 figs.

the growth of zoned and twinned plagioclase crystals in hornfels in the Wallowa Mts., Oregon, and Cascade Mts., Washington, giving to rocks with the appearance of igneous rocks, is ascribed to recrystallization-replacement by processes of additive thermal metamorphism. L. J. S.

Fox (Cyril S.). *Buchanan's laterite of Malabar and Kanara*. Rec. G. Survey India, 1936, vol. 69, pp. 389-422, 7 pls.

The localities described by F. Buchanan, who gave the name laterite in 1807, were revisited. Here the laterite rests on kaolinized granite and acid gneisses, and is a vermicular lithomarge with residual quartz and a little granular felspar. The amount of quartz ranges from 26% at the bottom of the bed to 5% at the top, and there is an upward concentration of Fe_2O_3 . Eight analyses by F. Raoult show that the portion soluble in H_2SO_4 is hydrated aluminium silicate with little or no aluminium hydroxide. This lithomargic laterite thus differs from aluminous laterite occurring on basaltic rocks of the Deccan and elsewhere. In both cases, as a result of humid tropical weathering, there has been a removal of silica by alkaline solutions, but so long as free silica is present as quartz the alumina remains in combination as silicate.

L. J. B.

FENNER (Clarence N.). *Bore-hole investigations in Yellowstone Park*. Journ. Geol. Chicago, 1936, vol. 44, pp. 225-315, 15 figs.

Bore-holes were put down in two geyser basins; (1) with alkaline waters, and (2) with acid sulphate waters. Steam pressures and temperatures are noted and a detailed petrographical examination with chemical analyses made of the cores. The rhyolitic and dacitic lavas have suffered much alteration. Besides the deposition of silica as quartz and opal, (1) Na and Ca of the felspars are replaced by K giving secondary orthoclase, while at higher levels the Na and Ca give rise to the formation of much analcime and heulandite (clinoptilolite). In (2) the felspars decompose to clay, as kaolin with acid waters nearer the surface, and as beidellite with carbonated waters at greater depth. Meteoric waters sinking in the rocks of the area have met high-temperature magnesian exhalations and so were forced upwards again.

L. J. B.

SHAUB (B. M.). *The origin of cone-in-cone and its bearing on the origin of concretions and septaria*. Amer. Journ. Sci., 1937, ser. 5, vol. 5, pp. 331-344, 4 figs.

Porous silt deposited by recent floods at Hadley, Massachusetts, showed, after the water had drained away, a series of conical pits, which suggest the origin of one type of cone-in-cone structure. Another may be due to pressure in already consolidated beds. The occasional presence of this structure on the upper surface of concretionary nodules suggests that these were originally porous and deposited at the same time as the enclosing sediments.

L. J. B.

LAIR (Pierre). *Sur les formations sableuses de la basse Provence orientale.* Compt. Rend. Acad. Sci. Paris, 1937, vol. 205, pp. 999-1000.

The heavy minerals (separated by bromoform) of the Permian and Eocene sandstone of Provence are in small quantity and chiefly mica, a little limonite and chlorite. Those similarly separated from the Eocene sands of the same neighbourhood are much more abundant, as regards total quantity and number of species. These include tourmaline, kyanite, garnet, tourmaline, apatite, and limonite, with little andalusite and titaniferous minerals.

C. A. S.

ZARITSKY (A. N.)] Заварицкий (А. Н.). Об изучении химизма горных пород с помощью диаграмм.—ZAVARITSKY (A. N.). *On the study of the chemistry of rocks by means of diagrams.* Академику В. И. Вернадскому к пятидесятилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 1041-1058, 1 fig. (Russian with English summary.)

Refining petrochemistry as the 'study of relations between the chemical composition of rocks which form natural complexes and the comparative study of the chemistry of these complexes' the author gives a outline of his new scheme of representation of chemical composition of rocks by means of a diagram embracing ten variables. S. I. T.

LEWINSON-LESSING (F. Y.)] Левинсон-Лессинг (Ф. Ю.). О несиликатных магмах.—LEWINSON-LESSING (F.). *On nonsilicate magmas.* Академику В. И. Вернадскому к пятидесятилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 989-997. (Russian with English summary.)

The existence of non-silicate magmas, as products of liquation-differentiation of silicate magmas, is postulated. These magmas give rise to rocks classed as apatitolites, carbonatites, sulphidolites, quartzites, and ferrolites.

S. I. T.

KORZHINSKY (D. S.)] Коржинский (Д. С.). Зависимость минералообразования от глубины.—KORJINSKY (D. S.). *Dependence of mineral stability on the depth.* Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 369-384 (Russian), pp. 385-396 (English), 9 figs.

Classification and discussion of the mineral facies of metamorphic

rocks together with a critical examination of the equilibria in metamorphic processes.

S. I.

[KUPLETSKY (B. M.)] Куплетский (Б. М.). Геолого-петрографический очерк Хибинских тундр.—KUPLETSKI (B. M.). *The geological petrographic structure of the Khibine tundras on the Kola peninsula*. Академику В. И. Вернадскому к пятидесятилетию научно-педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 1013-1024, 1 fig., 1 map. (Russian with English summary.)

The concentric, lopolith-like, igneous complex of the Khibina tundra is assumed to have been formed in four successive stages: (1) chibite (outer ring) and foyaite (central part); (2) unevenly-grained nepheline-syenites (rischorrite, &c.); (3) ijolite-urtite with the associated phosphate magma; (4) various dikes. For the complex of the Lovozero tundra three stages are postulated: (1) lujavrite; (2) foyaite; (3) augenporphyry, tinguaite, monchiquite, fourchite, picrite-porphyrite. The genesis of the alkali rocks of the Kola peninsula is discussed [Cf. M. 7-35].

S. I.

[CHIRVINSKY (P. N.)] Чирвинский (П. Н.). Количество-химическая петрографическая характеристика сферо-содержащих пород Лопарской долины в Хибинской тундре.—ČIRVINSKIJ (P. N.). *Quantitative chemico-petrographical characteristics of the spheniferous rocks of the Loparsky valley of the Khibiny tundra*. Труд. II. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1936, no. 7-8, pp. 31-38, 3 figs. (Russian with English summary.)

The quantitative determination of minerals in micro-sections of selected samples of sphene ore from Ukspor, Khibina tundra, gave the following average (volume %): apatite 30.8, sphene 18.9, aegirine 13.1, nepheline 31.1, ilmenite 4.2, lamprophyllite 1.0, biotite 0.9. The calculated chemical composition of the ore gives TiO_2 12.87 and P_2O_5 12.51 %.

S. I.

[CHIRVINSKY (P. N.)] Чирвинский (П. Н.). Количество-химическая петрографическая характеристика эвдиалитовых пегматитовых вавнбед в Ловозерской тундре.—ČIRVINSKIJ (P. N.). *Quantitative chemico-petrographical characteristics of the eudialyte-pegmatite Vavnbed in the tundra of Lovozero*. Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1936, no. 7-8, pp. 39-46, 3 figs. (Russian with English summary.)

The eudialyte-pegmatite from Vavnbed has the following average composition (volume %): eudialyte 70.7, aegirine and arfvedsonite 18.3, feldspar and nepheline 9.0, lamprophyllite, murmanite and manganeseite (?) 2.0. The calculated chemical composition of the rock gives Na_2O 9.06 and TiO_2 3.00 %.

S. I. T.

CHIRVINSKY (P. N.)] Чирвинский (П. Н.). Химико-минералогическая динамика щелочных магм.—CHIRVINSKY (P. N.). *Chemico-mineralogical dynamics of the alkaline magmas.* Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 124–159, 1 fig. (Russian with English summary.)

The modal composition of nepheline-syenites suggests that feldspar and nepheline are present in them in equimolecular proportions, and that feldspar itself has equimolecular proportions of orthoclase and albite. The mechanics of differentiation of alkali magma are discussed, especially in their application to the rocks of the Kola peninsula. S. I. T.

OFEEV (V. M.)] Тимофеев (В. М.). Петрография Карелии. [*The petrography of Karelia.*] Петрография СССР, под редакц. акад. Ф. Ю. Левинсон-Лессинга, Сер. I, Региональная петрография, Вып. 5, Петр. Инст. Акад. Наук СССР. (The petrography of USSR, edited by F. Y. Loewinson-Lessing, Series I, Regional Petrography, Vol. 5. Petrographical Institute Acad. Sci. USSR), Leningrad, 1935, 256 pp., 1 map, 9 pls., 16 text-figs. [M.A. 6–242.] This volume of the series 'The petrography of USSR' contains a detailed account of the pre-Cambrian metamorphic, sedimentary, and differentiated igneous rocks. The tables of analyses at the end of the volume include: igneous and metamorphic rocks—151, sedimentary—107, and minerals—12 analyses. The bibliography includes 248 items. A clear geological map of the district enhances the value of this publication. S. I. T.

ARSHINOV (V. V.)] Аршинов (В. В.). Гранитоиды окрестностей озера Тургояк.—ARSHINOV (V. V.). *The granitoids from the environs of lake Turgojak.* Академику В. И. Вернадскому к пятидесятилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 1115–1154, 9 figs. (Russian with English summary.)

Eighteen analyses of granitic rocks from the district west of the Ural Mts. (southern Urals) are given and represented on various diagrams, some of which are new. S. I. T.

[ZAVARITZKY (A. N.)] Заварицкий (А. Н.). Петрография Бердяушского плутония.—ZAVARITSKY (A.). *Petrography of the Berdiaush pluton*. Труд. Центр. Научно-Иссл. Геол.-Разв. Инст. (Trans. Central Geol. Prospl. Inst.), Leningrad, 1937, no. 96, 406 pp., 23 pls. text-figs. (Russian with English summary.)

The Berdyaush intrusive complex (10×4 km.) is situated south of Cheliabinsk in the Ural Mts. The outer part of the complex is formed by aplitic granite and rapakivi granite with numerous inclusions of diabase and hybrid rocks (diorite, syenite-diorite, &c.). The inner part is formed by syenite and nepheline-syenite showing intrusive relations to the outer granite. A detailed petrographical description and 26 rock analyses are given. It is suggested that rapakivi granite is formed as a result of a progressive contamination of granite magma. This gave rise to a partial metasomatic replacement of potassium feldspar phenocrysts and the resulting formation of oligoclase manzanaite. The questions of hybridization and hybrid rocks are fully discussed. A classification of hybrid rocks is suggested. Syenite and nepheline-syenite are shown to be genetically related to granite, and the theories of their formation is discussed.

S. I. 1

[IVANOV (L. L.)] Иванов (Л. Л.). К минералогии топазовых месторождений Волыни.—IVANOV (L.). *On the mineralogy of topaz deposits in Volynia*. Труды Ломоносов. Инст. Геохим. Крист. Мин., Академии Наук СССР (Trans. Lomonosov Inst. Geochem. Cryst. Min., Acad. Sci. USSR), 1936, no. 7, pp. 79–98. (Russian with English summary.)

Large vugs in granite-pegmatites [M.A. 6–305] contain the following minerals: morion (up to 99 kg.) and other forms of silica, orthoclase, albite, zinnwaldite, biotite, muscovite, and topaz (prismatic, light yellow to blue, while the blue variety is rare, highly fractured with etched surface, $2V$ 63 – 65°). Chemical analyses are given of orthoclase and zinnwaldite, and the genesis of pegmatites is discussed.

S. I. 1

[LEBEDEV (P. I.)] Лебедев (П. И.). К петрографии и минералогии основных пегматитов Волыни.—LEBEDEFF (P. I.). *Beitrag zur Petrographie und Mineralogie der basischen Paegmatite Volyniens*. Академику В. И. Вернадскому к пятидесятилетию научно-педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 999–1010. 10 figs. (Russian with German summary.)

abbro from the region of Volodarsk, Volhynia, contains anorthoclase with segregations of (1) olivine, apatite, titanomagnetite, (2) oligoclase, pyroxene, titanolivine, hornblende, biotite, (3) miarolitic cavities with quartz, calcite, and pyrrhotine (low-temperature stage). Olivine (hortonolite) (anal. I) shows alteration to hisingerite (anal. II). The last mineral is chemically analogous to canbyite [M.A. 2-253]. Olivine (pigeonite) (anal. III) is positive, $2V$ 48° , $\gamma - \alpha$ 0.030, $\gamma:c$ 24°.

SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	H_2O
33.62	0.15	3.48	—	48.58	0.86	10.19	1.83	0.51	0.18	1.02
36.64	trace	—	36.88	5.51	—	1.26	0.83	—	—	18.57
44.49	1.00	4.35	1.58	23.36	0.42	10.45	12.80	0.64	0.23	0.72

Totals: I. 100.42; II. 99.69; III. 100.04.

S. I. T.

BESBORODKO (N. I.)] Безбородько (Н. И.). Кристаллическая полоса Украины, как геопетрогенетическая провинция, и средний химический состав ее магматических пород.—BESBORODKO (N. I.). *The crystalline stripe of the Ukr. SSR as a geopetrogenetic province and average composition of its igneous rocks.* Академику В. И. Вернадскому к пятидесятилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 1083-1114, 3 figs. (Russian with English summary.)

Rock analyses from the Ukrainian pre-Cambrian block are averaged for 4 typological districts. A total average, assumed to represent the primary magma, has been calculated by taking into consideration the distribution of rock-types.

S. I. T.

ASIMOV (A. P.)] Герасимов (А. П.). Геологическое строение минераловодского района. II. Кристаллические породы северных лакколитов Пятигорья.—GUÈRASSIMOV (A.). *Les roches cristallines du groupe nord des laccolithes de Piatigorsk (Caucase du nord).* Труд. Центр. Научно-Иссл. Геол.-Разв. Инст. (Trans. Central Geol. Prospl. Inst.), Leningrad, 1937, no. 93, 84 pp., 1 pl., 1 map. (Russian with French summary, pp. 79-83).

The region of the mineral waters of the northern Caucasus comprises the laccolites of Pliocene age. The rocks are trachyliparites composed of clino-syenite (2V 30-40°, negative, $\alpha:c$ 5-10°) and potash-oligoclase (5-64°, negative). Albite, quartz, biotite, diopside, and amphibole are present in variable quantities. Thirty-five analyses of rocks (old and new data), fifteen analyses of minerals (feldspar, hornblende, biotite) and numerous optical data for minerals are given.

S. I. T.

[KUZNETZOV (E. A.)] Кузнецов (Е. А.). Петрографический Садонского месторождения.—KOUZNETSOV (E. A.). *Petrographical description of the Sadon mine*. Садонское свинцово-цинкое месторождение. *The lead-zinc deposit of the Sadon mine* (Kauznetsov). Научно-Техн. Упр. В.С.Н.Х. (Sci. Techn. Dept. Su. Council of National Economy), no. 368, Труд. Инст. Прикладной (Trans. Inst. Econ. Min.), Moscow, 1930, no. 46, pp. 3-53, 1 fig. (Russian with English summary, p. 53.)

The granodiorite complex of Sadon (central Caucasus) and associated effusive and intrusive quartz-albitophyre (keratophyre) is described. The paragenesis of minerals in magmatic and post-magmatic stages is outlined and the genetic connexion with the ore-deposit is traced. The order of crystallization in the granite follows the following series: (1) plagioclase and hornblende; (2) microcline and biotite (hornblende); (3) quartz and muscovite (after plagioclase). In the keratophyres the minerals of the first generation are plagioclase, hornblende and quartz. This is explained by the presence of mineralizers and different conditions of crystallization. The mineral assemblage of the ore can be compared with that of the late phases of granite and keratophyre. [M.A. 6-365.]

S. I.

[BARSANOV (G. P.)] Барсанов (Г. П.). Разность серпентина, нейфритоида и вопросы его генезиса.—BARSANOV (G. P.). *Une différence entre le serpentinite et le nephritoïde et ses questions de genèse*. Труды Ломоносовского Геохим. Крист. Мин., Акад. Наук СССР (Trans. Lomonosov Inst. Geochem. Cryst. Min., Acad. Sci. USSR.), 1933, no. 5-22, 6 figs., 1 map. (Russian.)

Nephritoid is a compact dark-grey or green variety of serpentinite composed of a felt-like aggregate of antigorite replacing serpentinite and bastite. It is found in a serpentine-rock on the river Lopanis (Osetia, Caucasus). It is assumed to be derived from serpentinite through the agency of hydrothermal solutions. Chemically it is similar to serpentinite.

S. I.

[ZALESKY (B. V.) & PETROV (V. P.)] Залесский (Б. В.) и Петров (В. П.). Мелкие моногенные эфузии центральной части Юго-Осетии.—ZALESSKY (B. V.) and PETROV (V. P.). *Small monogenetic effusions of [the central part of] southern Osetia*. Труд. Петр. Инст. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1934, pp. 115-140, 8 figs. (Russian with English summary.)

Monogenic types of extrusion (post-river-terrace in date and

but any trace of crater) are very numerous in south Ossetia (central asus). The rocks erupted, which are mainly basalt and andesite, are characterized by the presence of numerous xenocrysts of quartz and i-feldspar and it is suggested that some of them are the products of mimation of the surrounding rocks by the magma. Several analyses given.

S. I. T.

INSON-LESSING (F. Y.)] Левинсон-Лессинг (Ф. Ю.). Армянское вулканическое нагорье. [*The Armenian volcanic uplands.*] Природа [Priroda], Leningrad, 1928, no. 5, pp. 430-446, 9 figs.

Анdezito-базальтовая формация центральной части Армении.— LOEWINSON-LESSING (F. J.). *Andesite-basalt lavas of central Armenia.* Бассейн оз. Севан (Гокча), Акад. Наук СССР (The Basin of lake Sevan (Gokcha), Acad. Sci. USSR), 1929, vol. 1, pp. 5-113 (Russian), pp. 501-504 (English summary), 10 figs.

The effusive types of the Armenian plateau are as follows: (1) plateau which are generally understood to be connected with fissure eruptions, although no fissure-feeders have ever been observed in Armenia; (2) polygenetic volcanoes with a central crater; (3) monogenetic extrusive cones without associated lava flows; (4) parasitic slag cones. The lavas from the region of Novo-Bayaset and Erivan, described in the second paper, are mainly vitrophyric andesite-basalts with xenocrysts of andesine and occasionally of olivine and pyroxene. Seven analyses of rocks are given.

S. I. T.

Личков (B. L.)] Личков (Б. Л.). К характеристике геоморфологии и стратиграфии Алагеза.—Ličkow (B.). *Beiträge zur geomorphologischen und stratigraphischen Charakteristik des Alagös.* Алагез, вымерший вулкан Армянского нагорья. Том I, под ред. акад. Ф. О. Левинсон-Лессинга [*Alagez, an extinct volcano of the Armenian uplands.* Vol. I, edited by F. Y. Loewinson-Lessing], Труд. Сов. Изуч. Произв. Сил., Сер. Закавказская, Вып. 3 (Trans. Council Research Econ. Res., Transcaucasian Series, no. 3), Leningrad, 1931, pp. 3-113, 3 pls., 35 text-figs. (Russian with German summary.)

ЛЕБЕДЕВ (П. И.)] Лебедев (П. И.). Вулкан Алагез и его лавы.—LEBEDEV (P.). *Der Vulkan Alagös und seine Laven.* Ibid., pp. 117-179, 9 pls., 53 text-figs. (Russian with German summary.)

This volume contains an extensive account of one of the largest and most volcanoes of Armenia. The preface is supplied by F. Y. Loewinson-Lessing, who directed the expedition. The first part (pp. 3-113)

contains the geomorphological and stratigraphical account of Alagez by B. L. Lichkov. The petrological part by P. I. Lebedev contains a study of the complex polygenetic strato-volcano of Alagez with partly preserved central crater and a number of lateral eruptive vents and fissures. The volcano is made of a thick pile of lavas and tuffs. The igneous history comprises two complete cycles and the beginning of a third cycle, represented only by basalt (anal. I) and andesite. The first two cycles, in each case, show the following chronological sequence: andesite-basalt (anal. II), andesite (III), andesite-dacite (IV), dacite (V), and alkali-dacite (VI). With the exception of basalt, the other analyses represent the averages calculated by the author (the number of analyses averaged is shown in brackets). Altogether fifty-eight analyses of rocks are given. Of particular interest are the taxitic lavas first described by H. Abich (1882) under the name of tuff-lavas. Abundant pumice mostly belongs to the dacitic and liparitic magmas, with silica varying from 61 to 72 % and the refractive index of glass from 1.526 to 1.502.

	I.	II (8).	III (3).	IV (5).	V (11).	VI (6).
SiO ₂ ...	50.92	55.35	59.17	61.69	64.17	66.4
TiO ₂ ...	1.60	1.14	0.95	0.82	0.79	0.8
Al ₂ O ₃ ...	17.81	17.07	16.50	15.49	15.13	15.2
Fe ₂ O ₃ ...	3.96	3.02	2.15	2.54	2.88	2.0
FeO ...	5.12	4.42	4.15	3.71	2.32	2.0
MnO ...	0.11	0.09	0.08	0.11	0.07	0.0
MgO ...	6.10	4.89	3.56	2.49	1.65	0.9
CaO ...	8.43	7.26	6.10	4.78	3.49	2.2
BaO ...	—	—	—	—	0.07	trac.
Na ₂ O ...	3.55	3.25	3.61	4.12	4.42	4.8
K ₂ O ...	1.88	2.36	2.61	3.32	3.88	4.7
P ₂ O ₅ ...	—	—	—	—	—	0.1
H ₂ O+ ...	0.49	0.65	0.77	0.77	1.01	0.2
H ₂ O- ...	0.19	0.50	0.35	0.17	0.12	0.2
	100.16	100.00	100.00	100.00	100.00	100.0

S. I. T.

[LEBEDEV (P. I.)] Лебедев (П. И.). Месторождения пемзы Ала-
(Арагаца).—LEBEDEV (P.). *Die Bimssteinlagerstätten des Ala-*
(Aragaz). Труд. Петр. Инст. Акад. Наук СССР (Trav. I.
Pétrogr. Acad. Sci. URSS), 1931, no. 1, pp. 21–39, 1 map,
text-figs. (Russian with German summary.)

The pumice of Alagez (Transcaucasia), mainly found on the western and north-western slopes of the volcano, corresponds in its chemical composition to the dacite magma (n of glass 1.517–1.525) and trachydacite magma (n 1.515). Five analyses are given. S. I. T.

BEDEV (P. I.)] Лебедев (П. И.). Зона строительных туфовых лав Алагеза (Арагаца).—LEBEDEV (P.). *Die Zone der Tufflaven des Alagös (Aragaz)*. Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1931, no. 1, pp. 53–70, 1 map, 6 figs. (Russian with German summary.)

The tuff-lavas of Alagez (Transcaucasia) occur in a semicircular zone, situated between 1200 and 2200 m. of altitude, on the western and southern flank of the volcano. They belong to the dacite and trachydacite magmas. Cristobalitization and albitization are often observed. Their origin is explained by the explosive action of the magmatic gases.

S. I. T.

LESKY (B. V.) & PETROV (V. P.)] Залесский (Б. В.) и Петров (В. П.). Артикское месторождение туфовых лав.—ZALESKIJ (B.) und PETROV (V.). *Die Tufflavalagerstätte von Artik*. Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1931, no. 1, pp. 71–87, 12 figs. (Russian with German summary.)

The tuff-lavas of the north-western part of Alagez tuff-lava zone are described (preceding abstract). The upper tuff-lava forms the upper part of a dacite lava flow. The underlying trachydacite lava also shows a pitted upper and lower surface. The magmatic gases were responsible not only for the production of tuff-lavas but also for the formation of cristobalite, tridymite, and albite in these rocks. Four analyses are given.

S. I. T.

GINSBERG (A. S.)] Гинзберг (А. С.). Геолого-петрографическое описание северо-восточного побережья озера Гокча.—GINSBERG (A. S.). *A geological and petrographical description of the north-eastern shore of lake Gokcha*. Бассейн оз. Севан (Гокча), Акад. Наук СССР (The Basin of lake Sevan (Gokcha), Acad. Sci. USSR), 1929, vol. 1, pp. 157–218 (Russian), pp. 507–509 (English summary), 1 map, 26 text-figs.

— Геолого-петрографическое описание южного побережья озера Севан.—*A geological and petrographical description of the south coast of lake Sevan*. Ibid., 1930, vol. 2, pp. 13–71 (Russian), pp. 71–72 (English summary), 2 pls. of maps and sections, 20 text-figs.

— Геолого-петрографическое описание восточной части Севанского бассейна.—[*A geological-petrographical description of the eastern part of Sevan basin*.] Ibid., 1931, vol. 3, pp. 157–202, 2 pls. of maps and sections, 22 text-figs.

— Офиолиты Альпо-Апеннин и Закавказья.—[The ophiolites of Alps-Apennines and of Transcaucasia.] Труд. Геол. Муз. Академии наук СССР (Trav. Mus. Géol. Acad. Sci. URSS), 1930, vol. 1, pp. 1-7.

In the region of the lake Sevan (Gokcha), Armenia, the dominant rocks are lavas and tuffs of post-Eocene age. Numerous types are represented, including andesite-basalt, trachyandesite, albite-porphyrite, quartz-porphyry, dacite, liparite, &c., which are minutely described and altogether thirty-five analyses are given. The underlying sediments are of Devonian and Cretaceous age. Intrusive into the upper Cretaceous sediments are the rocks of the ophiolitic series (serpentine, gabbro, diabase, and spilite), which are compared with the ophiolites of the Alpino-Apennine zone. The origin of the various members of this series is attributed to a post-intrusive differentiation. S. I. T.

S. I. T

[GINZBERG (A. S.)] Гинзберг (А. С.). Пётрография Республики Армении. [*The petrography of the Republic of Armenia.*] Пётрография СССР под редакц. акад. Ф. Ю. Левинсон-Лессинга, Сер. Региональная пётрография, Вып. 2, Нетр. Инст. Акад. Наук СССР (The petrography of USSR, edited by F. Y. Loewinson-Lessing, Series I, Regional Petrography, Vol. 2. Petrographical Institute Acad. Sci. USSR), Leningrad, 1934, 127 pp., 1 map, 10 text-figs. [M.A. 6-242.]

The Soviet Republic of Armenia occupies the central part of Armenian plateau. It consists predominantly of Tertiary and Quaternary plateau lavas, lava cones, and associated pyroclastic products. A petrological study of these rocks initiated by H. Abich has been particularly intensive during the last decade and the present volume gives a concise account of this work. 199 analyses are given in separate tables. The bibliography includes 123 items. A very clear geological map is placed at the end of the volume. S. I. T.

S. I. T

[ZALESKY (B. V.) & PETROV (V. P.)] Залесский (Б. В.) и Петров (В. П.)
Материалы к изучению Анийского месторождения пемзы
ZALESKIJ (B.) und PETROV (V.). *Materialien zur Kenntniss
Bimssteinlagerstätte von Ani.* Труд. Петр. Инст. Акад. Наук ССР
(Trav. Inst. Pétrogr. Acad. Sci. URSS), 1931, no. 1, pp. 41-
5 figs. (Russian with German summary.)

The pumice deposits of Ani (Armenia), extensively exploited at present time, are found intercalated between andesite-basalt lava flows.

the pumice belongs to the liparite magma and is composed mainly of segments of fresh glass with just a few fragments of plagioclase, hornblende, and biotite.

S. I. T.

EOBRAZHENSKY (I. A.)] Преображенский (И. А.). Петрография Азербайджана. [*The petrography of Azerbaijan.*] Петрография СССР под. редакц. акад. Ф. Ю. Левинсон-Лессинга, Петр. Инст. Акад. Наук СССР. (The petrography of USSR, edited by F. Y. Loewinson-Lessing [Ser. ?, Vol. ?]. Petrographical Institute Acad. Sci. USSR), Leningrad, 1934, 161 pp., 22 text-figs. [M.A. 6-242.] Very little has been done as yet on the petrology of Azerbaijan rocks and the present volume is based principally on the unpublished material of numerous investigators. The igneous rocks are mainly found in the western part of the Armenian plateau within the boundaries of Azerbaijan. The account is given of the lavas, tuffs, and intrusive rocks as well as of some sedimentary rocks of the district. 50 analyses of igneous and 50 of sedimentary rocks are given in a separate table, and the bibliography includes 108 items.

S. I. T.

BYANKIN (D. S.)] Белянкин (Д. С.). Магматические горные породы и некоторые полезные ископаемые западной Грузии.—BELJANKIN (D. S.). *Magmatic rocks and some useful deposits of western Georgia.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1934, no. 6, pp. 93-114, 2 pl., 2 text-figs. (Russian with English summary.)

A review of the igneous rocks of western Georgia (Caucasus) is given. The pre-Cambrian and Palaeozoic rocks are represented by granite and gneiss. Diabase, porphyrite, and keratophyre of Jurassic age are very abundant as lavas and intrusives. Teschenite intrusions are probably of slightly later date. The Tertiary lavas and intrusions are mainly basalt and andesite, but an intrusion of syenite-gabbro was recently discovered near Batum. The economic products associated with the igneous rocks are also described.

S. I. T.

HOLMYANSKY (I. Y.)] Холмянский (И. Я.). Петрография Большого Ляховского острова в группе Новосибирских островов.—HOLMIANSKY (I. J.). *Petrography of the Great Liakhnovsky [sic] Island in the group of New-Siberia Island.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1936, no. 9, pp. 105-147, 17 figs., 1 map. (Russian with English summary.) The following igneous and metamorphic rocks are described: grano-

diorite, porphyrite, variolite, amphibolite, and hornfels. Seven analyses are given. The rocks show an affinity to those of the adjoining mainland described by Kupletsky [M.A. 6-319].

S. I. T.

[KORZHINSKY (D. S.)] Коржинский (Д. С.). Парагенетический анализ кварцодержащих бедных кальцием кристаллических сланцев Архейского комплекса Ю. Прибайкалья.—KORJINSKY (D. S.). *Paragenetic analysis of quartz-containing, almost calciumless crystalline schists of the Archaean complex to the south of Baikal-Sea.* Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1936, ser. 2, vol. 1, 247-280, 10 figs. (Russian with English summary.)

This is a study of high-grade metamorphic schists of sedimentary origin. The equilibrium conditions of a number of polycomponent systems, as deduced from the paragenesis of minerals, are discussed in detail.

S. I. T.

[KORZHINSKY (D. S.)] Коржинский (Д.). Петрология Архейского комплекса Алданской плиты (пересечение по р. Тимптон).—KORJINSKY (D.). *[The petrology of the] Archaean complex of the Aldan massif (traverse along river Timpson).* Труд. Центр. Научн. Иссл. Геол.-Разв. Инст. (Trans. Centr. Geol. Prospl. Inst.), 1936, no. 86, 76 pp., 1 pl., 7 text-figs. (Russian with English summary.)

Various pre-Cambrian gneisses and schists are described, including the charnockite series of metamorphic rocks (hypersthene-gneiss, bauxite-schists, and ultrabasic schists). Several analyses are given and the paragenesis of minerals is discussed.

S. I. T.

[WAKAR (V. A.)] Вакар (В. А.). Жильные липариты и обсидианы Колымского края.—WAKAR (W. A.). *Die Gangliparite und Obsidian aus dem Kolyma-Gebiete.* Труд. Петр. Инст. Акад. Н. С. ССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1933, no. 3, pp. 70, 5 figs. (Russian with German summary.)

Liparite dikes with obsidian margins are intruded into Carboniferous shales in the basin of the Beresovka (tributary of the Kolyma, N. Siberia). Liparite is genetically connected with aplite dikes derived from the adjoining granitic intrusion. It is characterized by phenocrysts of sanidine, albite-oligoclase, and quartz. The formation of skeleton crystals of quartz is attributed to the ultra-acid nature of the magma and the rapid cooling.

S. I. T.

EMMLEIN (G. G.)] Леммлейн (Г. Г.). Скелетные кристаллы кварца в липаритах.—LAEMMLEIN (G.). *Skelettförmige Quarzeinsprenglinge in Lipariten.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1933, no. 3, pp. 71–78, 10 figs. (Russian with German summary.)

The skeleton crystals of quartz from the Beresovka liparite (preceding tract) are described. It is suggested that certain cases described as 'eroded' quartz are really skeleton crystals seen in oblique sections and do not actually indicate magmatic corrosion. S. I. T.

ODAVETZ (V. I.)] Влодавец (В. И.). Об одном из современных Камчатских базальтов.—*On one of contemporary Kamchatka basalts.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1934, no. 6, pp. 283–292, 1 pl., 3 text-figs. (Russian with English summary.)

flow of block-lava erupted on January 25, 1932, from the parasitic crater Patzan (Kluchevskaya Sopka) is composed of basalt, which is slightly more basic than the one given by A. N. Zavaritsky [M.A. 6–421]. It contains phenocrysts of olivine and pyroxene in a fine-grained hypocrystalline groundmass. S. I. T.

ZAVARITSKY (A. N.)] Заварицкий (А. Н.). Лавы вулканов в окрестностях Мэргэня.—ZAVARICKIJ (ZAVARITSKY) (A.). *Les Laves des volcans des environs de Mergen, Mantchourie.* Докл. Акад. Наук СССР (Compt. Rend. Acad. Sci. URSS), 1936, vol. 1, pp. 357–360 (Russian), pp. 369–372 (French).

The lavas of the volcanoes in the region of Mergen, Manchuria, vary from glassy limburgites to microcrystalline olivine-basalts. All the rocks contain a varying amount of leucite which is considered to be a reaction product. The analyses by E. A. Sverzhinskaya and B. M. Frenkel are: glassy lava, Vasiliev volcano (I), holocrystalline lava, Teourè volcano (II) and holocrystalline lava, Podorozhny volcano (III). Chemically the rocks are compared with the gaussbergite-kajanite series, but petrologically they are classed with basalts.

SiO ₂ .	TiO ₂ .	Al ₂ O ₃ .	Fe ₂ O ₃ .	FeO.	MnO.	MgO.	BaO.	CaO.
53.36	2.57	13.65	1.67	6.37	0.17	6.13	0.08	5.47
52.12	2.55	13.89	3.79	4.65	0.25	6.56	0.16	6.40
42.84	2.49	12.13	5.86	4.43	0.17	11.80	0.18	10.44
Na ₂ O.	K ₂ O.	P ₂ O ₅ .	H ₂ O+.	H ₂ O-.	Total.			
3.55	5.76	0.68	0.85	0.07	100.35'			
3.40	4.94	0.71	0.56	0.36	100.34			
2.37	3.68	0.55	1.93	1.51	100.38			

S. I. T.

Miscellaneous.

HEWETT (D. F.). *Helvite from the Butte district, Nevada.* Amer. J. Min., 1937, vol. 22, pp. 803-804.

Grains and veinlets of lemon-yellow helvite occur with sulphidic massive rhodonite and rhodochrosite from Lexington mine. L. J.

FRASER (H. J.). *Microchemistry of the precious metal elements.* Amer. J. Min., 1937, vol. 22, pp. 1016-1034.

Micro-chemical reactions and recommended tests are given for Pd, Ru, Ir, Os, with mention of the minerals in which these elements are present. L. J.

WINCHELL (A. N.). *Cordierite.* Amer. Min., 1937, vol. 22, pp. 1175-1182, 2 figs.

Optical data, including recent data of H. Shibata [M.A. 6-479] plotted against chemical composition and against sp. gr. L. J.

IYER (M. R. Anantanarayana). *The formula proposed for the mineral vredenburgite.* Rec. Mysore Geol. Dept., 1936, vol. 34 (for 1935), pp. 75-84.

— *A graphical representation of the composition of some manganese minerals including a discussion of the nature of the mineral vredenburgite.* Ibid., 1937, vol. 35 (for 1936), pp. 73-85, 1 pl.

Partial analyses are given of vredenburgite from Beldongri, Devanhalli and Kodur [M.A. 7-157, 169], and of the portions soluble and insoluble in sodium oxalate and sulphuric acid, and the formula $a(\text{Fe}_2\text{O}_3 \cdot \text{Mn}_2\text{O}_4 \cdot \text{Fe}_3\text{O}_4)$ is suggested. Minerals containing Fe and Mn, belonging to three classes represented by bixbyite, jacobsite, and vredenburgite are plotted. L. J.

CESÀRO (G.) & MÉLON (J.). *Sur la forme cristalline de l'acmite.* Acad. Roy. Belgique, Cl. Sci., 1937, vol. 23, pp. 439-455, 6 figs. 1938, vol. 24, pp. 180-212, 11 figs.

Discussion of the different orientations of crystals of acmite. The prominent acute pyramid '(hh1)' is given the indices $(\bar{7}\bar{2}.75.10)$ and $(\bar{4}\bar{3}.45.6)$. L. J.

[GODLEVSKY (M. N.)] Годлевский (М. Н.). Уточнение понятия минерала.—GODLEVSKY (M. N.). *Exact definition of the notion of "mineral".* Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 107-111. (Russian with English summary).

the new definition reads: 'The mineral is a part of the earth crust,ogenous in the sense of a separate phase of physicochemical sys-'.
S. I. T.

BORNEMAN-STARYNKEVICH (I. D.)] Старынкевич-Борнеман (И. Д.).
Зывод и проверка химических формул нескольких Хибинских
титаносиликатов.—STARINKEVITSCH-BORNEMAN (I. D.). *Die Auf-
stellung und die Prüfung chemischer Formeln einiger Titanosilikate
aus den Chibina-Tundren.* Академику В. И. Вернадскому к
пятидесятилетию научной и педагогической деятельности. Акад.
Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936,
vol. 2, pp. 735–755. (Russian with German summary.)

Formulae of certain minerals from the Khibina tundra are discussed.
One is liable to take in NaNbSiO_5 and YtFeSiO_5 . In the analysis of
granite by N. I. Vlodavetz [M.A. 4–247] Nb has been overlooked.
Analysis by M. E. Vladimirova and V. S. Bykova gave SiO_2 23.36,
21.72, Nb_2O_5 15.00, Ta_2O_5 0.36, Fe_2O_3 0.52, CaO 25.88, SrO 0.32,
0.26, MgO 0.12, Na_2O 7.62, K_2O 0.62, F 4.56, H_2O 1.80 = 102.14 –
2 = 100.22; sp. gr. 3.30. Fersmanite belongs to the type A_2BSiX_6 +
and the dominant molecules are $\text{Na}_2\text{NbSiO}_5$ F and $\text{Ca}_2\text{TiSiO}_6$ with
admixture of CaNaNbSiO_6 , CaNaTiSiO_5 F, CaMnTiSiO_6 , and
 TiSiO_5 F. In ramsayite [M.A. 2–250] Nb has been detected. It
belongs to the type $\text{A}_2\text{B}_2\text{Si}_2\text{X}_9$ and the dominant molecules are
 $\text{Na}_2\text{Si}_2\text{O}_9$ and $\text{Na}_2\text{Nb}_2\text{Al}_2\text{O}_9$. Astrophyllite belongs to the type
 A_2X_{12} with $\text{Fe}_3\text{KTiSi}_3\text{O}_{11}(\text{OH})$ as dominant molecule and accessory
molecules containing Na, Ca, Mn, and Mg. S. I. T.

GERASIMOVSKY (V. I.)] Герасимовский (В. И.). К минералогии юго-
восточной части Луяврута.—GERASIMOVSKY (V. I.). *On the
mineralogy of the south-eastern part of Lujavr-Urt.* Труды Ломо-
носов. Инст. Геохим. Крист. Мин., Акад. Наук СССР (Trans.
Lomonosov Inst. Geochem. Cryst. Min., Acad. Sci. USSR), 1936,
no. 7, pp. 5–47, 17 figs, 1 map. (Russian with English summary.)

Five types of pegmatites associated with lujavrite and foyaite are
distinguished: (1) felspar-eudialyte-aegirine, (2) ussingite, (3) albite,
felspar-aegirine with ilmenite and sphene, (5) felspar-aegirine. The
rare minerals are described: pyrrhotine, pyrite, molybdenite, ga-
bbriffe, fluorite, elatolite, apatite, zircon, ilmenite, microcline,
clase, albite, nepheline, cancrinite, sodalite, ussingite (α 1.504,
 γ 1.509, γ 1.546, $2V$ 35°, positive), zeolites, aegirine, arfvedsonite,
astrophyne (isotropic, sp. gr. 3.08–3.10), eudialyte, mesodialyte,

lamprophyllite, aenigmatite, astrophyllite, ramsayite, sphene, neptunite, and loparite. Hackmanite gave on analysis by T. A. Burova: SiO_2 43.00, Al_2O_3 29.72, Fe_2O_3 trace, MgO 0.26, CaO trace, Na_2O 2.0, K_2O 0.44, Cl 2.52, S 0.25, $\text{H}_2\text{O} + 5.73 = 102.18 - \text{O} 0.57 = 101.61$. Schizolite (β 1.641, γ 1.677, $2V$ 51°, positive) gave on analysis by M. V. Vladimirova: SiO_2 49.10, TiO_2 0.02, MnO_2 9.35, $(\text{Ce}, \text{Yt})_2\text{O}_3$ 1.00, F 0.88, MnO 15.92, MgO 0.10, BaO nil, SrO 0.28, CaO 12.82, Na_2O 7.74, K_2O 0.74, $\text{H}_2\text{O} + 1.15 = 98.98$. Murmanite (sp. gr. 2.763-2.769) gave on analysis by T. A. Burova: SiO_2 30.93, TiO_2 29.51, ZrO_2 1.40, Nb_2O_5 7.71, Ta_2O_5 0.50, $(\text{Ce}, \text{Yt})_2\text{O}_3$ nil, Fe_2O_3 3.34, MnO 2.38, MgO 0.24, CaO 2.74, Na_2O 7.44, K_2O 0.56, F 0.19, $\text{H}_2\text{O} - 6.48$, $\text{H}_2\text{O} + 6.0 = 99.51$.

S. I.

[BONSHTEDT (E. M.)] Бонштедт (Э. М.). О сфене Хибинских тундр.

ВОHNSTEDT (E.). *On the sphene of Khibine tundras.* Труды Ломоносов. Инст. Геохим. Крист. Мин., Акад. Наук СССР (Trans. Lomonosov Inst. Geochem. Cryst. Min., Acad. Sci. USSR.), 1936, no. 7, pp. 49-78, 12 figs. (Russian with English summary.)

Sphene is an abundant accessory mineral of the nepheline-syenite of the Khibina tundra. In this paper varieties of sphene from different zones of the intrusion are described. They comprise the honey-yellow variety from the foyaites; brownish from the chibinites; dark brown from urtites; brownish (prismatic) and pink (poikilitic) from aphanites; yellowish and pinkish (fibrous-radial) from the contact-zones; secondary (after ilmenite?), yellow variety. A statistical study of the surfaces gives the following order of decreasing frequency of occurrence: (110), (100), (111), (001), ($\bar{1}\bar{1}\bar{1}$). Axial ratios $a:b:c = 0.7512:1:0.8$; $\beta = 60^\circ 18'$. Eight new and two previously published analyses of sphene are given. These show a relatively high percentage of alkalis and earths. Sp. gr. 3.482-3.571. The indices of refraction are relatively high; for the honey-yellow variety α 1.950, β 1.970, γ 2.092. $2V$ shows considerable variation. It is usually 17-20°, but for the brown variety it is 29-30°. Strong axial dispersion. Pleochroism is almost absent, except in the brown variety in which α , β light pinkish-brown, γ pink.

S. I.

[BONSHTEDT (E. M.)] Бонштедт (Э. М.). К изучению кристаллов ринколита.—ВОHNSTEDT (E. M.). *A study of rinkolite crystals.*

Труды Ломоносов. Инст. Геохим. Крист. Мин., Акад. Наук СССР (Trans. Lomonosov Inst. Geochem. Cryst. Min., Acad. Sci. USSR), 1936, no. 7, pp. 225-227. (Russian with English summary.)

well-developed prismatic crystals of rinkolite from Khibina tundra been measured and a table of results for nine crystal-forms is given. The angle (110):(110) is $63^\circ 4'$. [M.A. 3-275]. S. I. T.

WCHENKO (G. T.)] Кравченко (Г. Т.). К изучению нептуниита из Кильбийских и Ловозерских тундр.—KRAVTCHEKO (G. T.). *On the study of neptunite from Khibine and Lovozerk tundras.* Труды Ломоносов. Инст. Геохим. Крист. Мин., Акад. Наук СССР (Trans. Lomonossov Inst. Geochem. Cryst. Min., Acad. Sci. USSR.), 1936, no. 7, pp. 229-240, 6 figs. (Russian with English summary.)

Additional results of crystallographic measurement are given [M.A. 3-275] including a new form $k(\bar{3}12)$. Axial ratios $a:b:c = 1.3164:1:1.2$, $\beta = 64^\circ 36'$, $\gamma:c = 20^\circ 15'$, a nearly parallel to a , $\beta = b$, $\gamma = 90^\circ 08'$, $\beta = 1.6927$, $\gamma = 1.7194$, $2V_{Na} = 36^\circ$, positive. S. I. T.

PENKO (P. P.) & ORESHKIN (I. I.)] Пилипенко (П. П.) и Орешкин (И. И.). Изучение прозрачных пластинок тонкочешуйчатого графита.—PILIPENKO (P. P.) and ORESHKIN (I. I.). *Transparent lamellae of finescaled graphite.* Академику В. И. Вернадскому к тридцатилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 723-733, 7 figs. (Russian with English summary.)

Small hexagonal flakes of transparent and translucent graphite have been found in association with opaque graphite in talc-schist and marble in the Trans-Baikal region. Analysis gave C 96.98, H 0.88, O 10.2, ash 0.03 = 100.00. Sp. gr. 2.15, refr. index for red light 1.98-2.03. S. I. T.

POPOV (S. D.) & POPOVA (A. M.)] Попов (С. Д.) и Попова (А. М.). Спэррилит Центрально-Зейского района Дальневосточного края.—POPOV (S. D.) and POPOVA (A. M.). *Sperrylite from central Zeya region in Far East.* Труды Ломоносов. Инст. Геохим. Крист. Мин., Акад. Наук СССР (Trans. Lomonossov Inst. Geochem. Cryst. Min., Acad. Sci. USSR), 1936, no. 7, pp. 269-271. (Russian with English summary.)

Sperrylite together with rutile, magnetite, scheelite, garnet, zircon, ilmenite, pyrite, and kyanite, has been found in Zeya region of eastern Siberia. The crystals are rounded but faces (100) and (111) can be recognized. Analysis gave Pt 56.40, As 40.90, Fe 0.56, SiO_2 1.62 = 99.48. Microscopic analysis indicated Ru. [M.A. 4-519.] S. I. T.

[LAEMMLEIN (G. G.)] Леммлейн (Г. Г.). Наблюдения над скрученными кварцами.—LAEMMLEIN (G. G.). *Observations on the twisted quartzes*. Изв. Акад. Наук СССР, Отд. Мат. Ест., Сер. Геол. (Bull. Sci. URSS, Cl. Math. Nat., Sér. Géol.), 1937, pp. 937–964, 1 fig. (Russian with English summary.)

This is a study of 81 specimens of twisted quartz crystals from the Urals [M.A. 7–44], and Switzerland. The 'closed' type is not a true aggregate but a definite individual, and the 'open' type is merely a 'closed' type with split sub-individuals growing mainly along the a -axis. The majority of twisted crystals grow in the electro-positive direction of the a -axis. The satellitic sub-individuals are twisted on the c -axis, left-handed twisted to the right and the right-handed to the left. This contradicts the deductions of Rosický [M.A. 5–476], which are explained as being due to an error in the goniometric setting. The pitch of the (h) on an a -axis is proportional to the thickness of the crystal (a). In the majority of crystals the coefficient of twisting $k = h:q \cong 3$.

S. I.

[IVANOV (L. L.)] Иванов (Л. Л.). Два новых для рудных Нагольного Кряжа минерала—плюмбостибит и джемсонит. Iwanoff (L. L.). *Zwei neue Mineralien aus den Erzgängen Nagolnij-Gebirge—Plumbostibit und Jamesonit*. Академику Вернадскому к пятидесятилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee vol. Acad. Sci. USSR], 1936, vol. 2, pp. 789–793, 1 fig. (Russian with German summary.)

Acicular crystals of boulangerite (= plumbostibite) enclosed in are found in Nagolny range (Donetz basin). It is opaque, grey, sp. gr. 6.17, orthorhombic, with faces (120), (140), (160), and (180). Average of two analyses by K. K. Bouldovskaya gave Pb 56.22, S 22.83, S 18.68, corresponding to the formula $3\text{PbS} \cdot \text{Sb}_2\text{S}_3$. S. I.

[KRYLOVA (S. K.)] Крылова (С. К.). К кристаллографии байкалиита. KRYLOVA (S. K.). *On the crystallography of bajkalite*. Ломоносов. Инст. Геохим. Крист. Мин., Акад. Наук СССР (Lomonossov Inst. Geochem. Cryst. Min., Acad. Sci. USSR) no. 7, pp. 251–258, 8 figs. (Russian with English summary.) Baikalite (diopside) from Slyudyanka (lake Baikal region) divided into (1) high-temperature type, green, with dull fac-

ant forms (100), (001), ($\bar{1}01$), ($\bar{3}31$); and (2) low-temperature type, with bright faces and dominant forms (010), (110). Twins on
S. I. T.

ГАВРУСЕВИЧ (В. А.)] Гаврусович (В. А.). О составе флогопитов Слюдянки в зависимости от генетических типов-фаз флогопитового процесса.—GAWRUSSEWIČ (B.). *Über den Bestand der Phlogopite von Sljudjanka in Abhängigkeit von den genetischen Typen-Phasen.* Труды Ломоносов. Инст. Геохим. Крист. Мин., Акад. Наук СССР (Trav. Inst. Lomonossoff Géochim. Crist. Min., Acad. Sci. URSS), 1935, no. 5, pp. 99–111, 2 pls. (Russian with German summary.)

genetic types of phlogopite from pegmatite veins of Slyudyanka (Baikal region) are distinguished. Six chemical analyses are given as X-ray and spectroscopic analyses. S. I. T.

(Е. Е.)] Флинт (Е. Е.). О кристаллах каламина из Сулейман-Саяна.—FLINT (E.). *About calamine crystals from Suleiman-Sai.* Академику В. И. Вернадскому к пятидесятилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky 's 50th volume, Acad. Sci. USSR], 1936, vol. 1, pp. 109–118, 4 figs. (Russian with English summary.)

Dominant forms of hemimorphite crystals from Suleiman-Sai (Saihan) are (010), (110), (301), (031). The axial ratios are $a:b:c = 1:0.4788$. X-ray analysis gave $a = 8.52$, $b = 10.73$, $c = 5.30$ Å.

S. I. T.

ЧУХРОВ (Ф. В.)] Чухров (Ф. В.). Об анапаите на Керченском полуострове.—CHUKHROV (F. W.). *On anapaite from the Kerch peninsula.* Труды Ломоносов. Инст. Геохим. Крист. Мин., Акад. Наук СССР (Trans. Lomonossov Inst. Geochem. Cryst. Min., Acad. Sci. USSR), 1936, no. 7, pp. 273–281. (Russian with English summary.)

Light-green, tabular crystals of anapaite are found infilling cracks in iron ore together with baryte, gypsum, and calcite. The analysis is $\text{CaO} 35.31$, $\text{FeO} 18.66$, $\text{Fe}_2\text{O}_3 0.39$, $\text{CaO} 26.35$, $\text{MgO} 0.81$, H_2O n.d. This is identical with tamanite and closely analogous to messelite.

S. I. T.

[ZEMYATCHENSKY (P. A.)] Земятченский (П. А.). К вопросу о природе лёwigита Часов-Ярского месторождения редких земель. Лёwigит Часов-Ярского месторождения огнеупорных глин.—SEMJATSCHENSKY (P. A.). *Zur Frage die Zerstreuung seltener Erden. (Das Lœwigit des Tschasow-Yarkommsen feuerfester Tone.)* Академику В. И. Вернадскому пятидесятилетию научной и педагогической деятельности. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], vol. 2, pp. 713–722. (Russian with German summary.)

White and yellowish chalk-like lœwigite is found as nodules in clay and sand at Chasov-Yar, Donetz region, Ukraine. Analysis by E. A. Perepechina gave SiO_2 4.653, TiO_2 0.017, $\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3$ 4.00, BaO 1.179, CaO 1.088, MgO 0.310, Na_2O 1.316, K_2O 3.422, SO_3 3.481, rare-earths (Ce, Nb, Pr) 1.704, $\text{H}_2\text{O} +$ 14.971, $\text{H}_2\text{O} -$ 3.481, $1.114 = 100.395$.

S. I.

[BOLDYREVA (A. M.)] Болдырева (А. М.). Астраханит из месторождения Узун-Су (Туркмения).—BOLDYREVA (Anna). *Astrakanit from the Uzun-Su salt deposit (Turkmenia).* Зап. Всеросс. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 111–113, 3 figs. (Russian with English summary.)

Bloedite is found together with halite, thenardite, and mirabilite in the salt deposits of Uzun-Su, Transcaspia. It gave α 1.485, β 1.489, γ 1.489, 2V large, negative; dispersion strong, $r < v$. [Cf. M.A. 5–150.]

S. I.

[ALEKSEEEVA (E. F.) & GODLEVSKY (M. N.)] Алексеева (E. F.). Годлевский (M. N.). Рентгенометрическое изучение гидросиликатов никеля.—ALEXEEVA (E. F.) und GODLEVSKY (M. N.). *Röntgenometrisches Studium der Hydrosilikate des Nickels.* Зап. Всеросс. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 106, 1 pl., 5 text-figs. (Russian with German summary.)

X-ray and optical data with 25 chemical analyses are given on the nesumite and nickel hydrosilicates (serpentine, talc, sepiolite, coquimbite, garnierite, nepouite, &c.), and of halloysite and ferrihalloysite from various localities. Nepouite (= revdinskite) has a lattice structure similar to that of serpentine; and the garnierite (= genthite) lattice is similar to, though not identical with, that of cerolite. None of the hydrosilicates of nickel are analogous to sepiolite and talc. All [M.A. 6–150] is a distinct species. Connarite and röttisite may

endent species or perhaps only varieties of garnierite. Other minerals of variable composition, including 'chocolate-ore' revdinite, are mixtures of garnierite and halloysite. S. I. T.

ВСКИЙ (I. B.) & БЛОХИН (M. A.)] Боровский (И. Б.) и Блохин (М. А.). Анализ минералов методом рентгеновской спектрографии.—BOROWSKY (I. B.) and BLOCHIN (M. A.). *The analysis of minerals by the X-ray spectroscopical method.* Изв. Акад. Наук ССР, Отд. Мат. Ест., Сер. Геол. (Bull. Acad. Sci. URSS, Cl. math. Nat., Sér. Géol.), 1937, pp. 929–936. (Russian with English summary.)

umber of zirconium and titanium silicates were analysed both qualitatively and quantitatively by means of a spectrograph with a Li crystal (Cauchoi method). The zircons are characterized by the presence of Hf, Sr, Th, and the eudialytes by Yt, Sr, Ta. S. I. T.

ОРОПОВ (V. N.)] Протопопов (В. Н.). Определение рентгеноспектральным анализом редких земель в минерале хлопините.—PROTOPOROV (V. N.). *Determination of rare earths in the mineral khlopinite by means of X-ray spectral analysis.* Зап. Всеросс. Мин. общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 432–440, 6 figs. (Russian with English summary.)

methods of X-ray spectroscopic analysis are described and the results of the analysis of khlopinite [M.A. 6–258] are given. S. I. T.

с (L. v.). *X-ray image method of chemical analysis.* Amer. Min., 1938, vol. 23, pp. 215–226, 10 figs.

ays reflected from a polished ore specimen are resolved into monochromatic beams by reflection from a concave cylindrical surface of feldspar or mica, the pattern obtained indicating the chemical composition. [M.A. 6–378.] L. J. S.

ЧРОВ (F. V.)] ČUCHROV (F. V.). *Antlérite de la région Krestovozdvizhensk du Djeskasgan.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1937, vol. 15, pp. 95–96.

alets in sandstone in Kazakstan, Siberia, contain blue linarite which is mostly altered to green earthy antlerite. Analysis agrees with $2\text{Cu}(\text{OH})_2$. The linarite contains $\text{Cu}:\text{Pb} = 1:61:1$. Associated minerals are lead-ochre, cerussite, &c. L. J. S.

LAURO (C.). *Pirite di Monte Sisinni (Calabona-Alghero).* [Rend. Fac. Sci. R. Univ. Cagliari, 1937, vol. 8, no. 3, p. 3.] Abstr. Periodico Min. Roma, 1938, vol. 9, p. 148.

On pyrite crystals (*a e θ o p*) from the contact of limestone eruptive rock at this locality in Sardinia are implanted crystals enargite. L. J.

LAURO (Carlo). *Sulla presenza della parauricalcite I nella miniera Rosas (Sulcis).* Periodico Min. Roma, 1937, vol. 8, pp. 151-2 pls.

Among specimens of rosasite from Sardinia [M.A. 2-240] are found a bluish-green concretionary mineral which gave CO_2 19.43, CuO 4.2, ZnO 24.46, MgO 0.15, Fe_2O_3 0.39, PbO and NiO traces, insol. H_2O 8.28 = 100.30, sp. gr. 3.98-4.00; formula $\text{R}_2''(\text{OH})_2\text{CO}_3$ $\text{Cu} : \text{Zn} = 2 : 1$. This is identified with one of the analyses of parahalcite [M.A. 1-203]. The mineral breaks up into small rectangular cleavage flakes like rosasite and malachite, but with extinction 20-22° and n 1.708, 1.823. L. J.

LAURO (Carlo). *Su alcuni carbonati basici di rame e zinco naturali.* Periodico Min. Roma, 1938, vol. 9, pp. 105-136, 1 pl., 1 text.

Basic carbonates of copper and zinc fall into two groups. $2\text{R}''\text{CO}_3.3\text{R}''(\text{OH})_2$, aurichalcite I-IV with $\text{Cu} : \text{Zn}$ from 1:3 to 3:4. X-ray patterns similar to that of hydrozincite, $2\text{ZnCO}_3.3\text{Zn}(\text{OH})_2$. $\text{R}''\text{CO}_3.\text{R}''(\text{OH})_2$, rosasite with $\text{Cu} : \text{Zn} = 3 : 2$, paraaurichalcite II $\text{Cu} : \text{Zn} = 5 : 3$, paraaurichalcite I with $\text{Cu} : \text{Zn} = 2 : 1$, and cuprozincite $\text{Cu} : \text{Zn} = 9 : 2$. Rosasite (*a* 9.40, *b* 12.30, *c* 3.43 Å.) and paraaurichalcite (*a* 9.40, *b* 12.25, *c* 3.35 Å.) have X-ray patterns similar to that of malachite (*a* 9.38, *b* 11.95, *c* 3.18 Å.). Analysis of paraaurichalcite I occurring as thin crust on malachite pseudomorphous after chessylite from Tsu South-West Africa [M.A. 1-203], gave CuO 47.60, ZnO 24.70, H_2O 28.01. Aurichalcite from Campiglia Marittima, Tuscany, gave ZnO 53.41, CuO 20.37, FeO trace, CO_2 16.41, H_2O 9.90, insol. 0.20 = 100. Hydrozincite from Buggerru, Sardinia, gave ZnO 74.15, CO_2 1.5, H_2O 9.50, insol. 0.10 = 99.92. Malachite from Rio Marina, Elba, gave CuO 72.03, CO_2 20.04, H_2O 8.09. L. J.

Lo SARDO (Vera). *Halotrichite di Roccalumera (Sicilia).* Periodico Min. Roma, 1937, vol. 8, pp. 281-288, 1 fig.

White to yellowish, fibrous or compact halotrichite occurs with

interite between the pebbles of a Quaternary gravel. It has α 1.478, γ 1.484, maximum extinction 31–33°, sp. gr. 1.870; analysis, 36.42, Al_2O_3 10.54, Fe_2O_3 1.12, FeO 6.86, MnO 0.47, MgO 0.85, 43.63, insol. 0.37 = 100.26, agrees with $\text{R''SO}_4 \cdot \text{R''}(\text{SO}_4)_3 \cdot 21\text{H}_2\text{O}$. The hydration curve shows a loss of 26.91 % H_2O at 75°. L. J. S.

OB (J.). *Analysen dreier Tessiner Turmaline*. Schweiz. Min. Petr. Mitt., 1937, vol. 17, pp. 146–148.

also F 0.05), black tourmaline in albite-pegmatite near Brissago, della Madonna. II, black from Lago Leid, Campolungo. III, clear crystals in dolomite from Passo Cadonighino, Campolungo.

SiO_2	TiO_2	Al_2O_3	B_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	$\text{H}_2\text{O} +$
35.96	0.32	32.86	11.20	12.38	0.07	2.82	0.00	3.95	0.35	0.20
35.81	1.03	31.61	11.76	5.98	0.06	7.85	0.44	2.82	0.77	1.96
35.94	0.26	31.08	11.42	0.54	0.05	13.07	1.31	4.41	0.69	1.28

L. J. S.

(Hermann). *Vanadiumhaltiger Muscovit von Schmiedefeld (Kreis Saalfeld, Thür.)*. Chemie der Erde, 1937, vol. 11, pp. 38–44.

green fine-scaly mineral in quartz veins in the iron-ore deposits, usually thought to be pyrophyllite, gave SiO_2 44.40, TiO_2 0.09, 37.83, V_2O_3 1.08, Fe_2O_3 0.49, MgO 0.44, CaO 0.62, Na_2O 0.86, 38.30, $\text{H}_2\text{O} +$ 5.79 = 99.90; sp. gr. 2.80, β 1.593, γ 1.595, $2V_\alpha$ 38°, the X-ray pattern of muscovite. L. J. S.

OR (Ralph E.). *Water-insoluble residues in rock salt of Louisiana salt plugs*. Bull. Amer. Assoc. Petroleum Geol., 1937, vol. 21, pp. 1268–1310, 30 figs.

Residues average 5–10 % and consist largely of anhydrite grains, together with the following (in order of abundance): dolomite, calcite, quartz, limonite, haematite, hauerite, sulphur, celestine, marcasite, kaolin, gypsum, magnesite, boracite, and hilgardite [M.A. Inclusions of brine, gas, oil, and sand are not uncommon. Potash are also present in some of the plugs. L. J. S.

GENBACH (H.). *L'octaédrite de la Mabuya (Katanga)*. Bull. Inst. Roy. Colonial Belge, 1937, vol. 8, pp. 491–515, 20 figs.

concentrate from the Mabuya river consists mainly of small crystals of taite, yellow, dark blue, and grey in colour. Thirty crystal-forms listed, several of which are new. ω 2.501, ϵ 2.431 for a yellow crystal, 2.556 for a grey crystal (for λ 589). L. J. S.

SEBBA (F.) & PUGH (W.). *Gallium. Part II. The extraction of gallium and germanium from germanite.* Journ. Chem. Soc. London, 1937, pp. 1371-1373.

Analysis of germanite by fusion with NaOH gave Ga 1.25 % (higher than previously recorded) and GeO₂ 7.9 %. A quick, large-scale method of extraction is by slowly dusting the powdered ore into a strong solution of NaOH, when a vigorous reaction takes place, Ga, Ge, As, and some Mo going into solution. [M.A. 2-344; 3-59, 401; 5-240.] L. J.

MEIXNER (Heinz). *Artinit, Pyroaurit und Hydromagnesit aus Südserbien.* Zentr. Min., Abt. A, 1937, pp. 363-373, 1 fig.

New occurrences of these minerals are described from the chrome mines in the serpentine district in southern Serbia. Analysis of colourless white hydromagnesite from the Gorance valley gave MgO 43.11, CaO 37.09, H₂O 19.73 = 99.93. A complete list of localities for pyroaurite, brugnatellite, artinite, and nesquehonite is compiled. The 'Eisenite' from Siebenlehn, Saxony (F. Sandberger, 1880; M.A. 3-36) is called ferropyroaurite. L. J.

DENAHEYER (M.-E.) & GONIEAU (J.). *Méthode optique de détermination des tableaux des minéraux transparents ou opaques des concentrés sables d'alluvions.* Ann. (Bull.) Soc. Géol. Belgique, 1937, vol. 61, pp. B 266-B 296, 4 folding pls. (chart and tables).

Prospectors' samples are separated in heavy liquids and each fraction crushed in a series of liquids of known refractive index for optical examination. Opaque minerals are set in cement and polished for metallographic examination. L. J.

BUTTGENBACH (H.). *Sur un cristal de neptunite.* Ann. (Bull.) Soc. Géol. Belgique, 1938, vol. 61, pp. B 324-B 325, 1 fig.

New forms (11.11.10) and (21.10.10), associated with (110) and (100), are noted on a crystal from San Benito Co., California. [M.A. 3-220.] L. J.

BUTTGENBACH (H.). *Sur un cristal basé de quartz de Nil St. Vincent.* Ann. (Bull.) Soc. Géol. Belgique, 1938, vol. 61, pp. B 325-B 326, 2 figs.

A large rough face of the rare form (0001) is present on a crystal of quartz from Nil St. Vincent, Belgium. L. J.